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ABSTRACT

Presented are proceedings and related documents of a workshop on alternative energy resources which was held in April, 1980. This information is intended to bring reference librarians up to date on alternative energy technologies and available reference materials to which library patrons may be directed. Among the speeches included are those pertaining to alcohol fuels, wind-propelled cargo ships, electric automobiles, geothermal energy and methane research projects, and reference questions the Bay Area Reference Center (BARC) typically receives. In the appendix are listings and descriptions of alternative energy publications along with a directory of special library collections of energy-related materials in the San Francisco area. (WB)

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ALTERNATIVE ENERGY

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A BAY AREA REFERENCE CENTER WORKSHOP

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ALTERNATIVE ENERGY

A BAY AREA REFERENCE CENTER WORKSHOP

Held at the San Francisco Public Library
Civic Center
San Francisco, CA 94102

April 24 and 25, 1980

Workshop planning committee: Glenda Hooper, Audrey Powers, Kay Roberts (Chair) and Anne Roughton

Speakers: Janice Jacobson, California State Office of Appropriate Technology
Kay Roberts, Bay Area Reference Center
Patricia Lawrence, Napa City-County Public Library
Allan Van Vleet, Alternative Energy Collective, Berkeley, CA (April 24)
Carol Smith, California State Department of Food and Agriculture (April 25)
Courtney Beck, PG&E
Ivan Marts, Electric Auto Association
Jeannette E. Glynn, Information Resources Consultant

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Please note: Due to budget cuts for BARC's 1980-1981 fiscal year there will be no workshops this year. These proceedings constitute the only workshop proceedings BARC plans at this time.

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The workshop opened with this quiz, designed to provide some information and arouse interest in our energy problems. Answers are underlined.

ENERGY AWARENESS OPENERS

1. The U.S., with 6% of the world's population, consumes what percentage of the world's available energy each year?
   a. 2%
   b. 16%
   c. 30%

2. What percentage of the gas in a gas range is used for the pilot lights?
   a. 10%
   b. 30%
   c. 40%

3. OTEC stands for:
   a. Office of Technology, Energy and Conservation
   b. ocean thermal energy conversion
   c. Original Technology for Economic Continuity

4. U.S. energy costs in 1979 climbed by what percentage?
   a. 12%
   b. 25.6%
   c. 37.4%

5. What percentage of commuters use a private auto for trips to and from work?
   a. 25%
   b. 50%
   c. 95%

6. Gasohol is a mixture of:
   a. gasoline and ethanol
   b. gasoline and methanol
   c. either of the above

7. Sweden has a per capita income equal to the U.S. What percentage of our per capita energy consumption does Sweden use?
   a. 40%
   b. 55%
   c. 85%

8. Methanol can be produced from:
   a. wood
   b. coal
   c. both of the above
   d. neither of the above

9. What percentage of our energy in 1979 did we import?
   a. 64.5%
   b. 24.5%
   c. 13.5%

10. In 1979 solar collectors provided what estimated percentage of our domestic energy consumption:
   a. .01 - .02%
   b. 3.4 - 4.2%
   c. 7.5 - 8%

ALTERNATIVE ENERGY OVERVIEW, A SLIDE TALK

Janice Jacobson, California State Office of Appropriate Technology

Good morning. I'd like to start off by explaining a little bit about my office and what we do. The Office of Appropriate Technology was created by Governor Brown in 1976, to assist and advise the Governor and other state agencies in implementing resource and energy conservation technologies. We've had some success and butted up against some walls, but by and large many agencies under Governor Brown have changed some of the ways they do business. I'm in the Publication and Information Section, which is the public outreach part of OAT. Sample copies of our publications are on display.

Today I would like to give you a context for understanding your community's needs in the area of information on alternative energy. Also, I'd like to give you a brief overview on the state of the art on alternative technologies. I prefer to call them renewable resource technologies since they're no longer just alternatives, they are technologies we will have to use. Until the last few years, no one thought much about energy. If you needed light, you found the light switch and out came the juice. No one thought about how much energy we used or where it came from. Alternative energy technologies were thought of as hippie, back-to-the-land ideas and were pretty much dismissed by the status quo economists and planners. Now energy awareness is on the minds of a lot of people. Some revered and status quo institutions have also given credibility to the alternative energy movement, most notably Harvard University. Daniel Yergin, coauthor of *Energy Future: report of the energy project at Harvard Business School*, recently told a little story that illustrates that renewable energy ideas are no longer only in the realm of the back-to-the-landers. There was a line in the book describing people who had been involved in alternative energy technologies as people who eat granola. The coauthor, Robert Stobaugh, read that line and said, "What's granola?"! With that I'll begin the overview of the energy technologies and describe the very basic principles involved. (The slide presentation began at this point).

The development of decentralized energy resources and energy conservation is our best opportunity for a more stable energy economy. The book *Energy Future* indicates that without any change in lifestyle we can reduce energy consumption by 30-40% with aggressive energy conservation. Unfortunately, President Carter made some big budget cuts in the solar and conservation budget at a time when these programs are really needed. There are three ways we can approach the question of energy conservation. The first is to reduce the energy consumptiveness of new buildings through proper design. This slide is an artist's conception of a California state office building designed to use 40% of the energy usually used in office buildings. "Site One" accomplishes this through natural ventilation and passive solar design--taking advantage of the sun and its position in the orientation and design of the building. Natural lighting produces effective energy conservation. Many large office buildings have fluorescent lights which actually heat up the building and require air conditioning to mitigate that effect. In addition, most people find natural lighting much more comfortable to work under.

Recovering wasted energy is another way of reducing energy needs. Sonoma State University received a grant from the Department of Energy through the Small Scale Appropriate Energy Technology Grants program to develop a system to recover the wasted heat from the dryers in the dorm laundry and use that heat to preheat the water going into the washing machines. This system reduces the energy required to heat the wash water to the temperature that will clean the clothes. Recovering wasted energy has a lot of potential for industrial processes. This slide shows Ecoencore, an industry that recycles wine bottles and sells them back to the wine industry for reuse. A solar system and heat-recovery system were installed to heat the water for the washing operation.

Another approach to energy conservation is a system called cogeneration, which pri-

marily has industrial and institutional applications. Cogeneration is a system which uses waste heat to generate electricity for heating. In other words, waste heat from a boiler or industrial process is being recovered and used. About a month ago the Governor's office had a briefing with Union Oil and Fiat on Fiat's Totem unit. It looks like a washing machine and generates heat using natural gas, traditional fuels, methane and probably alcohol. Through the recapture of the wasted heat in water which circulates in the unit, it generates electricity. Cogeneration units have an interesting advantage over centralized electrical plant generation. They are a lot less expensive to install and use a by-product already there. One of the attractive qualities in many of the reusable technologies is that they are decentralized; they are near-site or on-site systems. Small industrial cogeneration units would reduce the peak load of utilities. Peak hours are the times when electricity needs are highest. Cogeneration units could eliminate the need for new power plants built to add capacity to handle peaking problems. The problem in the past has been the unwillingness on the part of utilities to buy back excess power from these small generators of electricity. Utilities in California are now required by the Public Utilities Commission to buy back the excess power at the rate they would pay for new sources of power.

Finally, the kinds of conservation most of us think about are measures to reduce residential energy consumption. One of the main obstacles to home energy conservation is concern that conservation will cause a reduction in lifestyle. Once people are aware of the problem, i.e. rising utility bills, they want to do something. The problem is finding out how to do it, finding someone else to do it, and finding materials. The city of Davis tried solving this problem with a Retrofit Day. Local hardware stores, businesses and community groups joined together to provide information on weatherizing homes. For example, people found out about a service which does weatherstripping, caulking and installing insulation blankets on hot water heaters, all for $7 an hour labor plus materials. The fair allowed the community to see what was available and make the necessary connections. The hardware stores sold all of the hot water heater blankets in two days. Weatherization at the local level is something community groups can become involved with. This is a picture of a group in Arcata called New Energy, which has a well-developed weatherization program for low-income homes. They have a good resource center and also do community workshops on building greenhouses, food dryers, etc.

Solar energy is an attractive resource to politicians and more government bureaucrats are jumping on the bandwagon. Solar does represent great potential for meeting energy needs. It's not the panacea for all our energy problems; it's more applicable in some places than others, but it has an appropriate use in almost every location. I have some friends who are building a solar house up in Anchorage, Alaska. Even in a cold climate, solar has a place.

A solar oven is a simple project that has been used in classrooms and by community groups to demonstrate the basic principle of light radiation striking a surface and being converted to heat. That's the basic, simple concept. Kids just glom on to that. What happens to your car when it is left in the sun all day? It gets hot. Kids catch on fast and are stimulated to think about ways to use that energy.

Domestic hot water heating is one solar technology feasible now. This particular system is made of three stripped-down hot water heaters painted black encased in an insulated box with a lid of plastic or glass glazing. The hot water rises to the top of the tanks and circulates through the backup heater, or if hot enough, goes directly into the hot water lines. These collectors are very inexpensive compared to flat plate. These tanks, or "breadbox" heaters don't freeze up as easily as the flat plates; they act as collector and storage. The are passive; no pumps are necessary. Hot water rises naturally, and the city water pressure in many cases creates enough pressure to move the water.

This slide shows a flat plate collector for a community pool in Santa Clara. Pool heating is one of the most economic current applications of solar. A large percentage of the solar tax credits claimed have been for pool heating. With the cost of gas continuing to rise, solar pool heating won't need a tax credit to be economically practical. Municipalities are installing solar systems for the public swimming pools; this one is in Palo Alto.

Food drying is another application of solar technology. It can be done on a small scale like this program in Santa Cruz where school children are learning solar in a hands-on science program, Project Life Lab. Hands on is a term heard or seen a lot in regard to renewable energy technologies, because the emphasis is on do-it-yourself. This is a large scale application of solar for agricultural fruit drying. This is a picture of grape drying (raisin) operation in California, Lamanuzzi and Pantaleo.

Another solar use is for space heating, which is merely heating up a space; most people would call it heating their living room. Air conditioning is space cooling. Passive solar space heating involves a building designed with lots of thermal mass, i.e. high mass material that absorbs heat, retains it and reradiates it in the evening when ambient temperature drops. An example of an active system is one which uses flat plate collectors to collect heat and circulates the heated water through tubing in a slab floor, thereby heating up the slab and using radiant heating to heat the house. So there are many different ways of using solar for space heating. Some of the solar homes in Village Homes in Davis have active systems; it depends on the size of the house and the living habits of the occupants. In many cooler locations people need more heat, and the passive system can be supplemented with an active system. The Corbetts, who are the developers of Village Homes, have received international publicity for this community. In their own home, they have just a passive system, with a woodstove as backup heat. They used their woodstove only seven times one winter. Still another way to use passive space heating is as a retrofit. A house already built can't be reoriented to face south for maximum passive heating benefits. Systems must be retrofitted. A greenhouse retrofit is one way of introducing heated air into an existing building. The greenhouse, through plastic glazing, absorbs heat, and that heat is pulled into the house through venting. It's another opportunity for a lot of community involvement. Greenhouse raising is sort of like old time barnhouse raising! This slide shows Heart Federal Savings and Loan in Auburn. An active system both heats and cools their facility.

This solar installation training program in San Bernardino has a very interesting history. Valerie Pope and several other welfare mothers were fed up with their reliance on the welfare system and the future their kids were facing. So they formed a community development corporation to create jobs for youth in the community. This program developed into a solar installer training program.

Solar energy can also generate electricity. One way of doing this is through the photovoltaic process that chemically converts sunlight to electricity. Photovoltaics are decreasing in cost five years ahead of DOE estimates. Photovoltaics soon will be a cost-competitive source of energy.

Windmills were a common sight in rural communities in the early 1900s. They were used to pump water or their mechanical action was converted to electricity and stored for use on the farm. With the Rural Electrification program, utility lines were brought to the countryside and windmills fell into disuse. Interest in windmills and wind electric generators is surging once again as utility costs rise. Although California does not have many working models, interest is high and our office is siting several small scale systems as field tests for collecting data on different types of installations. In an area where there is utility service, a small wind electric generator can feed excess power back into the utility grid; in essence running the meter backwards. This makes the economics of wind machines much more attractive since storage has been one of the major costs of an autonomous wind system. Only recently the Public Utilities Commission in California required that utilities buy back excess power at the rates it would pay for power from new plants. A landmark case in New York established a precedent for the PUC's actions: a wind machine was put up on a tenement building that had been rehabilitated by a community group. Con Edison, the big utility company said that they wouldn't buy any power from the group. The windmill people took Con Ed to court and won. It changed the whole course of Con Ed's interaction with small energy producers.

This is a picture of the Loma Vista Farm Garden Center. It's a life laboratory where children can have hands-on experience in all kinds of things, including gardening and raising animals. One of the projects here is a Savonius wind rotor, a very simple build-it-yourself wind machine. It's essentially several 50 gallon drums put together

in a way to catch the wind and spin. It can start in a low wind instead of the high wind speeds of 12 to 15 miles per hour required to start a lot of electric wind generators. This application is used for pumping water because of its low efficiency. Wind machines come in all shapes and sizes. This slide shows a large scale system similar to ones being tested by the Federal Government at Rocky Flats in Colorado. This machine, built by the University of Massachusetts, has the largest wind generator propeller span in the world. You can see the type of blade on the wind machine is different from those old types. This has a design using the same aerodynamic principles as an aircraft. This is a wind generator proposed by Southern California Edison. The utilities are looking to wind generators for large centralized systems that would feed directly into their grid like all other power generating facilities. These things are so enormous that about 15 people could lie end to end on one of the propellers.

Another very interesting project is the Golden Gate Energy Center. There are plans to convert Fort Cronkhite to an energy center similar to Fort Mason. It would have demonstration sites, including wind machines; meeting rooms and office space for energy groups.

Biofuels are another area of energy technology. This slide shows Tri-Valley Growers in Modesto. Peach pits are pulverized into fine biocombustibles and the resulting gases are fed into a boiler as fuel. The PG&E representative will describe the Mountain View methane project later this morning. In Modesto the city is conducting a similar project and will use the methane to run their fleet of city cars. Alcohol fuels will also be discussed later this morning, so I won't get into the technical aspects. Our office gets a lot of questions from people who want to make their own alcohol. We supply information on the basic technology and some idea of the role that alcohol will play in California. We are not the Midwest. We don't have a surplus of grain to convert into alcohol fuel, but we do have a great deal of agricultural wastes. We do have feed stocks, but it's very important to have some sort of State policy so that people don't start making alcohol fuels right and left without thinking about these things. Another problem in California is pollution. The 10% alcohol, 90% gasoline mixture called gasohol creates hydrocarbon pollution due to higher evaporative emissions from the carburetor. One expert said that if all the cars in Los Angeles were running on gasohol, they would have about a 40% increase in pollution.

Someone yesterday wondered what questions I get as Information Specialist at OAT. I get lots of questions from people who have new inventions and so I developed a list of funding resources for inventors. I urge people who call me to contact local energy groups if there is one in the area. If you aren't sure whether there's an energy group in your town or county, call me. Bay Area Energy Action at Fort Mason has a lot of workshops and programs. In the Bay Area, Environmental Action Clearinghouse acts as a referral system; another active group is the Berkeley Energy Co-op.

In conclusion, I would like to say that I'm very glad to be addressing librarians. With the growing interest by governments and community groups in producing local energy, I think that libraries will have a real role and can be a very valuable information resource for communities trying to create a saner and more stable energy future.

* * * * *

COMMERCIAL SAIL AS AN ALTERNATIVE ENERGY SOURCE

Patricia Lawrence, Napa City-County Public Library

The magnificent *Fennia* was the last of the big square-rigged Cape Horners to be dismasted going around Cape Horn. Except for a few grain ships that hung on until the second World War, this dismasting symbolized the end of one of the most energy efficient forms of transportation the world has known. In the sixty years before *Fennia*'s dismasting on May 3, 1927, there had been about 50,000 sailing voyages around Cape Horn. In the thirty years thereafter there were less than 200. Sailing ships had carried cargo on the world's oceans for more than five thousand years. The sailing clipper ship and coastal schooner have become romantic memories, revived on occasion, such as

the "Tall Ships Parade" in New York Harbor on July 4, 1976.

The wind-powered cargo ship will have a role in our radically changing energy scene. The use of sail propulsion as a viable alternative to fossil fuel propulsion is rapidly becoming an economic reality. This morning I'll describe recent research and development activity in commercial sailing vessels.

Whether a wind-propelled cargo vessel is economically competitive with one propelled by burning fossil fuel is almost exclusively dependent upon the price of the fossil fuel. This was true around the turn of the century when ships burning dirt-cheap oil replaced the sailing ships. It is just as true today. Perhaps we should put this price of fuel in some perspective as it relates to ocean shipping. In 1972 bunker fuel cost $2.13 per barrel of 42 gallons in the United States. By March of 1980 it had increased by more than ten times to over $22.00 per barrel. While the cost of fuel was about five percent of the total operating cost of a ship in 1972, it has now increased to between 35 percent and 60 percent, depending upon the size of the ship and type of its engine.

Today the world's 25,000 ocean-going ships use from five to eight percent of all of the oil consumed in the non-communist world. In this context one begins to identify the magnitude of the impact of even a partial switch to wind propulsion for ships. Wind power is free. It creates no pollution. It is free of foreign political control. It had powered cargo ships for years. It is in unlimited supply.

Bureaucrats and ship owners are among the world's most conservative individuals and are slow to change. The sailing ship owners of old were themselves slow to embrace the new-fangled steamship until some of their competitors had made fortunes with them. The first reaction of the shipowner to higher fuel costs is an increase in freight rates and a reduction of the vessel speed to save fuel.

Advances in materials and ship operating techniques have made new forms of sailing ships possible. The first modern research on sailing vessels was done in the 1950s by Dr. Prolss, a German engineer at the Schiffbau Institute in Hamburg. He did extensive research on an automated system of computerized square sails on rotatable masts without wire support stays. The proposed ship, called the *Dynaship*, was a 17,000 dead-weight-ton bulk cargo carrier with steel masts 175 feet tall on which the sails would be trimmed or furled from the bridge. In 1974, The Dynaship Corporation of America in Menlo Park acquired the American rights to the mast and sail systems. Bill Warner, the president of the company, states that the ship would maintain a 10 to 12 knot speed under sail and would consume only about ten percent of the fuel used by a comparable diesel driven ship.

In 1972 Hugh Lawrence of Sausalito purchased the hull of *Fennia* and investigated the possibility of returning the ship to commercial service under a modern rig, but the cost of bringing the steel hull up to the standards of modern regulatory bodies made the project unfeasible. After the oil embargo of late 1973, however, the computer studies and cost analysis that had been done for the *Fennia* project became the basis of the *Western Flyer* conceptual design of a four-masted schooner able to carry 4,500 tons of cargo. Ocean Carriers Corporation was formed by Lawrence and several members of the shipping industry and ocean racing fraternity to present the *Western Flyer* concept to the U.S. Maritime Administration for ship financing.

In 1974 the price of fuel had increased to the point where the Maritime Administration asked the University of Michigan to study sailing cargo vessels. The 1975 Woodward Report summarized their work. Using a theoretical modified square-rigged ship, somewhat like the *Dynaship*, the report found sailing cargo vessels to be technologically feasible but only marginally economic, considering the prevailing fuel price of $11.25 per barrel. The San Francisco to Sydney, Australia route was found to be favorable to sail. It was determined that moderate changes in the energy cost situation would make it more favorable to sail, and further research was recommended.

In 1975 Congressman Brown of California introduced Joint Congressional Resolution 444 to ask for a further study of wind-propelled cargo vessels. In response, Robert Blackwell, then head of the Maritime Administration, advised that the Woodward Report had proven sail power to be unfeasible and the Resolution failed to pass. In 1976 Ocean Carriers Corporation approached the Maritime Administration for assistance with the *Western Flyer* and was advised that Maritime Administration policy excluded all sailing

vessels from any of the benefits of the Merchant Marine Act which provides for the mortgage funding of ships. This policy was reversed in 1977 through the efforts of Congressman Brown's office and Ocean Carriers.

Meanwhile in 1975, for the first time in 70 years, the Royal Institution of Naval Architects held a symposium on commercial sail in London. In 1976 Liverpool-Polytechnic held another symposium on the subject in Liverpool.

Captain Mike Willoughby of Windrose Ships, Limited, received a grant from the Department of Industry of the United Kingdom for preliminary study of a 12,000 dead-weight-ton sailing vessel, based on a design derived from the square-riggers, but built with modern materials and automated sail handling systems. The design is for use on the London-Australia run, with projections showing passage times of 45 days and costs less than the competing motor ship.

In late 1977 an oil rig drilling platform was towed out of the Mississippi River by tug boats while being partially propelled by the largest individual sails ever made. The rig, *Rowan Louisiana*, proceeded to its intended location 200 miles offshore. An estimate of the fuel savings at that time stated that there would be a $100,000 savings for each one-half knot of speed gained from the sails, assuming a tow from New Orleans to Saudi Arabia. Because of the increased price of fuel, the figure would be about twice that today. The two Bermudan mainsails were each 180 feet tall, 75 feet at the foot, weighted 4 tons and took 6.6 miles of stitching.

The *Patricia A*, originally launched as an auxiliary powered three-masted cargo schooner, is being completely refitted as a two-masted schooner with a modern, efficient sail plan. Estimated voyage speed is 9 knots, with highest speeds of about 12 knots. The new engine to be installed has more power than the one the ship used as a motor-ship, but the engine is only intended to be used about 30 percent of the time. The ship will carry cargo from Florida to the Caribbean in competition with six shipping companies now operating on the route. The ship will be advised by an on-board computer and will have extensive instrumentation to record the actual dynamics of a sailing cargo vessel.

The Japanese are studying the feasibility of installing sail systems on existing full-powered ships, with the thought that the ship would continue to operate under power but would be assisted by the sails, so the system designed would require no additional crew and would need little maintenance. They have determined that the system is economically feasible and results in savings of at least 10 percent in overall operating cost of the ship. They are now proceeding to design a sail-assisted cargo vessel to carry automobiles to the United States, and will outfit a 3,200 dead-weight-ton tanker with sails to get further operating data. The results are savings of 140 million tons of fuel per year just for Japan if applied to all suitable ships.

In December of 1979 the U.S. Maritime Administration finally awarded another research contract into the feasibility of sailing cargo vessels for the American Merchant Marine. This study was awarded to Windship Development Corporation of Norwell, Massachusetts, and basically is an updating and refining of the Woodward Report. When completed, the report will outline further research work to be done.

There seems to be no question that oil prices will continue to rise dramatically, making energy conservation measures and the utilization of alternate energy sources more imperative with each passing day. The Oil Minister of Saudi Arabia, addressing the *Shipping 2000 Conference* in London recently, said that irreversible oil shortfalls in supplies may take place as early as 1988. Unless consuming nations adopt radical non-oil programs, the crisis which may then develop will be of such magnitude as to make the current situation appear like a mere passing event of trivial consequence.

The sailing cargo vessel is the only means of transportation which can use an alternative energy source directly. There is no need to convert it to electricity, no new source of energy to be developed, no complex hydrogen engine, no shale oil deposit or solar cell or Arctic oil that has to be found, studied, processed and researched.

There will be several significant things happening in the near future regarding wind-powered cargo vessels. The Maritime Administration report will furnish a new base for further research work. The Japanese testing will continue and the United Kingdom research will start to take a firm direction. The *Patricia A* will set sail from England to the United States on the first of the voyages of the modern type sailing cargo vessel

in commercial service. It will be a most exciting picture.

[See bibliography "Commercial Sail" p.24]

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ALCOHOL FUELS

Carol Smith, California State Department of Food and Agriculture

In the brief time I have today to discuss alcohol fuel I'll touch upon the state of the art, the process of making alcohol fuel, the legality, and some safety items.

Regarding the state of the art, the technical feasibility of processing alcohol fuel is unquestioned. The technology has been in existence for many years. I'm sure many people have uncles who were moonshiners perhaps during the days of Prohibition, and I hear about backyard stills at work. Farmers are digging up that beautiful copper still that their uncle once used. I haven't heard too many successful stories.

Production of alcohol fuel has been around about 70 or 80 years. The technology has pretty much stayed the same. Henry Ford's first "Model Ts" could switch from the alcohol tank to the gasoline tank. You could say our automotive industry started with alcohol. When gasoline became such a cheap automotive fuel, alcohol just left the picture.

Next I'll describe the process of making alcohol fuel. There are really two types of alcohol now being considered for fuel. One is ethanol, beverage alcohol, the alcohol you can drink. The other is methanol, wood alcohol, which can cause blindness if consumed. They are comparable as a fuel. Ethanol does have a higher energy content per volume than methanol. Both have their pros and cons.

When making alcohol one needs a still. It's basically a two-step process: fermenting a feed stock, then distilling it. However, prior to fermentation, the feed stock must be processed. As an example, ethanol can be made from fruits or vegetables that have a high sugar content or grains with a high starch content. Grains require converting the starch to simple sugars before fermentation and distillation. First the grain is ground and milled, and the starch molecules exposed. Then water is added in the process called slurrying, and enzymes are added to break down the starches to sugar. Through the process of liquefication, the substance is cooked, more enzymes added, and the starches further reduced to sugars. It's cooled during the conversion process, leaving the simple sugars ready for fermentation. The substance is cooked again at a stable temperature and yeast is added for about two or three days. The yeast feeds on the sugar and produces, as a by-product, the alcohol. Finally, with the use of a still, the fermentation mash is boiled to a temperature where the alcohol evaporates before the water and is thereby separated from it.

The third main point that I'll discuss concerns the legality and permit process. We get a lot of questions from people that are just gung ho and want to do it right now. But they don't know what sort of permit is needed or whether it's legal. They don't know how to go about it. The first place to go is the county, for a use permit, then the Federal Bureau of Alcohol and Tobacco and Firearms for an experimental license. They have two kinds of licenses: one for commercial, large scale industrial-type processes; the other for small scale use on farms or other private property. They are really tight about it. The still must be locked, not necessarily in a building, but contained. Basically, they don't want you to drink it. The revenue collected on beverage alcohol in the United States exceeds eight billion dollars a year. There's so much money involved, so they are very careful.

On the other side of the coin, if you are producing a larger quantity and selling gasohol, you would have to register with the IRS indicating you are going to purchase gasoline, mix it with your alcohol and sell it. There is a 4 cent per gallon tax exemption right now if you sell it, and that translates into 40 cents per gallon of alcohol you're producing. So, it's quite a substantial sum if you are going to distribute it. If you are an oil company distributing gasohol, you have to collect 7 cents per gallon on

each gallon you sell because in California it's just a general fuel tax. Finally, a seller's permit is needed for the sales tax. If you are making it to use on your own property, it's no problem. But once you try to sell it, it becomes a big involvement.

Next I'll discuss gasohol versus pure alcohol. There has been a lot of controversy on gasohol stemming from the California Air Resources Board. When gasoline and alcohol are mixed in that 90/10% combination, there are higher evaporation emissions from your carburetor. This isn't from your tailpipe. As a matter of fact, gasohol is probably better as far as emissions are concerned out the tailpipe of the car. But when you turn off the car the engine is still hot for another 10 minutes, and fuel from the carburetor evaporates causing smog problems. There are ways around it, though. In the new cars, a closed carburetion system would take care of most of the evaporative problems. The Air Resources Board isn't allowing gasohol to be sold during the summer months because evaporative emissions increase when it's hot. It's possible to include an additive during the refining process that lowers this problem. The other problem is that mixing more than 10% alcohol into gasohol requires some engine modification for existing vehicles. However, Toyota is coming up with a car that has a microprocessor control on the carburetor, which will automatically adjust to fuel mixtures.

Finally, on the subject of safety, alcohol is extremely flammable and obviously safe and enclosed equipment should be used in the distillation and fermentation process. Other than that, I don't see any problems.

In summary, the state of the art is improving. The process is an old process that is timeworn, tested and true. The legality problems are easing up. It can be a hassle, but at this point it's feasible to get permits. The controversy on gasohol and pure alcohol will be resolved. There is so much state and national interest in the use of alcohol fuels due to the unstable fossil fuel supply and the escalating price of fuel, and the option of energy self-sufficiency is a very attractive one.

(The first question is about Brazil's gasohol program.) Brazil now uses 20% alcohol in their cars, and they are shooting towards 100% in 5 years or so. Brazil has a large sugar cane feed stock, and is using that to make alcohol fuel. It's interesting that the cars being used range from Volkswagens to Mercedes. Cars that run on alcohol are in existence and don't have problems with emissions. I think, in fact, Brazil has improved their air quality as a result of going to alcohol fuel.

(Another question is about octane and mileage.) It is possible there would be some reduction in miles per gallon, but it would only be a very small percentage, and this hasn't really come out in any of the tests, probably since gasohol is only 10% alcohol. The strange thing about gasohol is the combination of alcohol and gasoline forms a different chemical combination and it's unpredictable. Maybe on the whole you would get a bit fewer miles per gallon.

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ALCOHOL FUELS

Allan Van Vleet, Alternative Energy Collective

Allan Van Vleet, in his talk on alcohol fuels at the April 24th workshop, covered some similar points. Additionally, he paralleled our addiction to oil to drug addiction. We can quit cold turkey or come up with alternatives methadone-style. Hydrogen fuels are not developed enough yet, propane is also a fossil fuel, not a real alternative. At present, alcohol is the only real alternative.

The history of alcohol is long; the first written record for beer goes back to 2000 B.C. in Babylon. Lavoisier recorded the chemical composition of alcohol in 1790. Pasteur, in 1859, determined the yeast and anaerobic environment necessary for alcohol production. Distillation was known to Aristotle, who also knew the burning potential of alcohol. Adam Still, in 1801, developed the first reliable still. He was a small time inventor with a great impact on our society. When the government arrived to tax

the process we had the Whiskey Rebellion, since people felt the government had no right to tax their backyard operations. The first internal combustion engine ran on alcohol, and alcohol lamps were common at the turn of the century. Henry Ford preferred alcohol to gasoline because of its cleanliness; his Model As and Ts could run on alcohol, gasoline or a combination. In the '30s, European countries were blending 10-25% alcohol into their fuels. During World War II alcohol was used as fuel, but after the war gasoline again was cheap and plentiful.

The current interest in alcohol fuel owes much to Lance Crombie, a Minnesota farmer who has made some dramatic changes in your legal right to produce fuel. In 1977 Crombie combined his Ph.D. in microbiology, $18, and farmer's ingenuity to produce a solar still. The revenuers confiscated that still and started the court fight which resulted in the first experimental license to produce alcohol fuel. It's now easier to get permits, due to his challenge of the bureaucratic structure.

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PG&E PROJECTS: GEOTHERMAL, METHANE, AND PUMPED STORAGE

Courtney Beck, Industrial Power Engineer, PG&E

No one has a pat answer about our energy future. There are many different things which are being looked at today. Some conservation measures are what is known as energy positive. That is, a piece of equipment or a system which directly saves energy. However, some systems considered by themselves may appear energy negative. When considered in an entire system, however, they may produce beneficial results.

One such system, presently under construction, is the Helms Pumped Storage Plant. It utilizes the existing reservoirs and waterways in the mountains approximately 50 miles east of Fresno. We hope that after this plant is constructed, we will be able to add about one million kilowatts of energy for our electric sypply system. One million kilowatts is basically enough to supply a city about the size of San Francisco. Helms Pumped Storage is a modified form of hydroelectric power, and one of the good things about it is we don't have to build more reservoirs. It uses what is there. The thing we did have to build was approximately 3,000 feet of underground tunnelways, and we had to excavate into the side of a mountain about 1,000 feet down.

Hydroelectric power is basically generated by allowing water to drop or fall through a channelway which is known as a penstock. The water strikes a turbine wheel, and spins a generator which creates electricity. The Helms project is unique in that the turbine itself can be reversed and water can be pumped back uphill. How do we save energy? To understand this, we have to look a little bit at the electric supply system and what is meant by electricity demand. The nature of the electricity demand is that during the afternoon and into the evening hours the demand for energy increases. We call this our peak period. However, at night and during the early morning hours, we have a low energy demand. It is at this point that energy would be held back at Helms' storage plant and the water would then be pumped back uphill to be reused the following day. Therefore, by taking the base load of the utility system and increasing it during the off-peak times, we actually benefit. For every 3 kilowatt hours that we save by allowing the use of Helms, we actually have to expend 4 kilowatt hours to pump the water back up. But the great advantage of the plant is that it can be used for peaking and it can come on line instantaneously. The main disadvantage of this plant is that the cost is approximately $380,000,000.

Demand for energy is certain to grow; at what rate, no one can really say. I've heard predictions of anywhere from 3% up to 7%. But the demand will be there. That energy will come from many different sources, and we can't build many pumped storage plants at $380,000,000. Let's look at other means.

One PG&E is looking at right now is expansion of the geysers 90 miles north of San Francisco. The geysers are not Yellowstone's Old Faithful type of geyser. A gey-

ser is basically an occurrence in nature in which both steam and hot water emit at sporadic intervals. The geysers up north are actually fumaroles, basically fissures or cracks in the earth which allow steam to be ejected on a fairly continual basis. What makes the geysers useable for geothermal power is their unique location 30 miles from the earth's magma. Also the water quality, mineral deposits, and very fine type of steam are there. The geysers were actually discovered about 1847, but it was not until about 1922 that the first attempt to cap the geysers was made. It was successful, but there was not enough technology available to bring the steam to a successful power plant, due to the corrosive and abrasive action of the particles included in the steam.

In 1956, two companies, Magma Power and Thermal Power, decided to develop the area. This was possible because of technological developments enabling stainless steel to withstand abrasive action. We went into a partnership with Magma and Thermal Power to develop the geyser field. Magma and Thermal merged their operations in 1967 with Union Oil, to bring in additional resources for the development of the field. Today we have approximately 200 wells and 13 generator systems online at the geysers. By the end of this year we will have about 980,000 kilowatts of capacity added to our system, and hopefully by 1990 that will be expanded to almost 200,000,000 kilowatt hours, enough to serve about two cities the size of San Francisco.

Another geothermal resource may involve hot brine from the Imperial Valley. We haven't developed the technology yet to utilize this brine, but hope that within the next 10 years we will have. If so, the potential of the Imperial Valley may be greater than the geysers.

Geothermal alone is not enough potential energy technology to carry us through. Another possibility is utilization of municipal solid wastes. Right now we are involved in a pilot project with the Environmental Protection Agency and the City of Mountain View. We hope to see approximately one million cubic feet of gas from what 10 years ago we would have called a dump site. This one million cubic feet of gas represents the use of electricity for about 3500 homes. We hope to expand the pilot project to about four million or five million cubic feet per day. The whole concept of solid waste management was kicked off by a situation in the Los Angeles and Palos Verdes area in the mid 1960s. The landfill was seeping methane and they decided to drill wells and burn the methane off. They didn't want methane surrounding the area. It's combustible; in the right quantity and oxygen content it could explode.

Solid waste management involves a landfill cover at least 30 feet deep. Within 6 months to 1 year, the aerobic bacteria start to absorb the organic material from potatoes, orange rinds and other materials which were once living organisms--trees, leather and even plastic. The aerobic bacteria in breaking this down uses up the oxygen content and then gives off anaerobic microbes of bacteria, which is what we are interested in. The anaerobic bacteria then arranges itself into carbon dioxide and methane, CH_4. The CH_4 will then rise in the area which creates a problem. You cannot allow the bacteria to spread too rapidly or it will destroy everything within the fill site. Then your very useful project goes down the drain in a very short time. The methane rises, but then it must also be treated because the methane that comes out of the ground is only good for about 450 BTU cubic feet. Our system has approximately 750 to 1100 BTU's per cubic feet, so the gas we get out of there is not of sufficient value. We separate carbon dioxide; take the particulate out of it, and then pump this gas directly into our transmission main which is located at the site. As I said, there are problems with this right now, and we have not solved all of them.

One of the problems is we don't know how long the site is going to last. Our present projection is anywhere between 12 or 20 years. The cost of drilling the wells and installing the facilities like Mountain View (30 acres and 18 wells) is about $20,000,000. A modified program would include building a chambered area or bladder area. This area would then be put into production just as the rest of the landfill would be, and when production starts to decline, the waste could be replaced. Hopefully, this type of landfill area could replace about 1% of our company's natural gas supply. DOE says that if these are going nationwide, perhaps 1% of our total energy needs could be met with this type of system or project. No one approach will solve the energy problem. They all have to be put together.

(Mr. Beck was asked about environmental problems at the geysers.) The greatest complaint up there has been about hydrogen sulfide, which comes out as a gas. However, we have been able to construct separators capable of taking about 90% of that hydrogen sulfide out of the gas. The wells at the geysers involve an area about the size of this [Lurie] room leveled off with a cylindrical-type well and pipelines. Our biologist replants the trees and shrubs and so forth in the area around the sites.

(The next question concerned energy replacements for natural gas we now must purchase from Canada, Texas, etc.) As far as the information I have, we will probably never be totally free of bringing in natural gas from other sources. It depends upon what happens. I have heard of possible offshore gas fields which may even outstrip the gas which is expected from both Canada and Alaska. However, there is going to be a problem with offshore fields.

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ELECTRIC AUTOS

Ivan Marts, President, Bay Area Chapter of the Electric Auto Association

Fifty years ago, the internal combustion engine appeared to be the ideal servant. Today, unfortunately, the servant appears to have enslaved the master. It's not only poisoning the air that we breathe, its rapid use of gasoline has us groveling at the pump for a weekly fix. Rather than seeking alternative fuels for this modern day version of the dinosaur, let us seek a more docile servant.

At this time I would like to present a prospective applicant for this job, and explain its credentials. During the first two decades of this century, electric vehicles were used extensively in this country. Their popularity began to decline in 1920, and in 1930 they were considered obsolete. They were no longer in production. Since many 1921 electric Packards were still running in 1950, apparently not everyone agreed with this opinion. Great Britain certainly hasn't agreed. They have 60,000 electrical trucks in operation today, and electrical milk trucks have been a common sight on British streets for 30 years. The United States Postal Service imported 30 electrical vans from England in 1972. If any of you are from Cupertino you are familiar with these electrical vans which have provided mail service in Cupertino for the last 8 years. So, after 50 years of neglect, the electric vehicle is returning slowly to our streets.

Electric vehicles of today can achieve a range of 40 miles in city traffic. Since 50% of our gasoline is consumed on trips under 7 miles and daily ranges of 20 miles, this is more than adequate for most of our urban transportation. The 5,000 pound station wagon offering 7 miles per gallon is hardly the appropriate technology to apply to local shopping trips. The electric vehicle under these conditions will offer 40 miles per gallon of oil burned in a power plant. More importantly, 16% of our electricity comes from oil. Therefore, a major portion of our urban driving could be removed from the oil economy. Although they have a limited range, electric vehicles have several socially redeeming characteristics: they require very little maintenance, they are quiet, they are not polluting, and they seem to last indefinitely. No tune-up or oil changes are required, so regular trips to the service station are eliminated. They are recharged during off-peak hours giving the utility companies a load-leveling device which they have been seeking for years. The vehicle's short range may require some trip planning, but could eliminate unnecessary trips. The end result is badly needed conservation of energy. What appears to be a handicap can also be thought of as an asset.

Research into new battery concepts is under way throughout the world as well as improvements in every other component of the vehicle. The range will be extended to 120 miles within 2 years, and 300 miles by the end of this decade. 50 years of neglected research is not going to be recovered overnight, but progress is being made. Unfortunately, we are still 5 years away from mass production. General Motors contends that the market does not exist for a vehicle with a 40 to 50 mile range. Three years ago

they said the same thing about the small fuel-efficient cars that the government was trying to get them to build, the ones that they are now trying to get the government to stop the Japanese from exporting.

Approximately 1,500 electric vehicles were produced in 1979 in the United States. Most of these were for fleet feasibility studies, but a few found their way into private hands. They are essentially takeoffs on existing small cars and vans, and the prices start at about $10,000. In addition, vehicles are being produced by backyard mechanics throughout the country. These are typically old Volkswagens that have been converted using surplus aircraft parts and mechanical ingenuity. Conversion kits for this purpose witness the emergence of a new cottage industry.

The Electrical Auto Association was founded in 1967 to promote and encourage the experimentation in electric vehicles and to act as a clearinghouse of information. The chairman, John Newell, 1249 Lane St., Belmont, CA 94002, should be your initial contact if you have any questions. If anyone is seeking information on electric vehicles, they can save an awful lot of time by getting touch with the local chapter. The association has a library of technical manuals and publishes a monthly newsletter. The basic membership dues are $15 per year, which includes the quarterly *Electric Vehicle News*.

(Mr. Marts is asked how portable the rechargeable unit is.) In the case of smaller vehicles such as mine, the charging unit is built into the car, and it goes with the car. You normally recharge at home.

(Will they go uphill? is the next question.) It depends on the vehicle. My original vehicle, a Citicar, was basically a souped-up golf cart--direct drive without transmission. That is to be avoided. The Electravan represents a better state of the art. They retain the basic 4-speed transmission, and I haven't found a hill yet it won't take.

(The next question is the cost for an overnight charge.) Roughly 2 cents a mile for the charge. 350 miles a month of driving costs me between $7 and $8. The entire operating cost of the car is about 7 cents a mile.

(The last question is the life and replacement on batteries.) Roughly, they are golf cart batteries, and the average life span is about 3 years depending on how much you drive. They're rated basically at 480% discharge cycles, 5 cents per mile.

[See Information Sheet p.27]

BARC AND ALTERNATIVE ENERGY REFERENCE QUESTIONS

Kay Roberts, BARC reference librarian

I am going to cover three aspects of BARC and alternative energy reference questions today: the kinds of questions BARC gets, our resources for answering questions, and special issues of ethics and energy reference questions.

We get questions when a topic is covered by the news and patrons want more information. When Lance Crombie wrote the *Mother Earth News* articles on making alcohol fuel, BARC received several questions on building solar stills, the enzymatic hydrolysis of cellulose, and where to get the enzyme. I'm sure that soon we'll all have plenty of books on making alcohol fuel, but these questions came ahead of the publishing business. Besides questions generated by news, BARC gets the kind of question libraries can't answer because it turns out that what the patron wants to do is just not possible. A recurring example is making methanol out of wood. We have had this question several times from patrons who have a supply of wood chips and know that during the early 1900s methanol was made from wood, so they want to do it. Our answer has been that the process requires lots of equipment and is not small scale technology. We've updated the research each time we get the question; I recently noticed a paragraph in *Small Farm Energy News* that a Nebraska farmer had come very close to a method that could make methanol from wood on a small scale. So part of the excitement about alternative energy, that experimentation is being done by independent individuals, is also part of the problem. Results of their experiments aren't published in indexed sources. Consequently I'm always a little concerned about telling a patron--no you can't do that--for fear somebody has just found a new way.

BARC also gets routine questions: the address for a Bay Area electric car club, consumer information on woodstoves, bibliographic information on a new book on gasohol by former moonshiner turned Mormon. We get how-to questions; how to convert your car to run on propane or electricity, and also general interest questions from patrons just interested in finding out how tidal power, etc., work.

Those are some of the kinds of questions BARC gets. I would next like to cover the resources BARC uses in answering those questions. I'm going to talk about seven categories or resources in the order we MIGHT use in answering the question, although we might jump right to what I am calling resource seven, databases, as soon as we start the question. Usually, however, source one, the first place we look when we start work on a question is BARC's information file. This is not a clipping file or file of information which we keep up to date anticipating questions BARC might get. It is our file of questions we have worked on which we think might possibly come up in the future. So when we first answered the question on making methanol from wood in 1975, we filed that answer. The next time it comes up, we might be able to answer the question from the file, or by quickly updating the research. You're always welcome to drop by the BARC office on the second floor and look at the information file.

Our second source is to go back to what you have told us about where the patron found out about the subject and what you have been able to supply for the patron. We want to start our research knowing how much the patron has, so we don't duplicate what the patron already knows. We realize that you can't always check your patron's source; perhaps they have access to a book or periodical that you do not have in your library. But if you let us know what it was, and we can check it, we might find a bibliography, resource person, or other clue that will get us right into the question, rather than starting from scratch. So it helps BARC to know as much as possible about the sources the library and patron have used.

My third category or resource is standard sources--books, indexes, periodicals in the SFPL collection. We also have access to the collection at UCB. The BARC staff visits UCB frequently to copy or borrow materials not in San Francisco's collection.

Our fourth resource might be going outside these collections to special libraries. Part of your kit materials profile some of the special energy libraries. Audrey Powers has visited many other special libraries; some prefer that questions are referred to them through BARC. I worked on one interesting question about propane. The patron wanted to know how much propane could be made out of oil if just propane and no gasoline were made. I was pretty sure that you couldn't do that, but it is the sort of question that always makes you feel a little unsure if you are not knowledgeable on the subject. I spoke with Chevron to answer that question, and was able to refer the patron to their fuels expert if he had further questions.

A fifth resource is other systems, including BARC's counterpart in Southern California, SCAN. We read the systems' newsletters and should notice if a question has come up and been answered in another system.

Our sixth resource has already been mentioned, those expert resource people. Indexes, our information file, or other libraries suggest a subject expert who provides information or suggestions on sources.

The seventh resource might be a database search through the State Library. Frankly I have not been that successful in answering energy questions using databases. One reason might be that many of our patrons are looking for the kind of practical small scale information which doesn't turn up in a technical index. On one occasion I had better luck searching *Engineering Index* manually than by computer. We do have that resource, however, at present through the State Library. Hopefully BARC will soon have direct access to databases and that should improve our success with this source.

Having covered some of the kinds of questions BARC gets and our resources for answering questions, I would next like to talk about librarians, ethics, and energy questions.

Energy reference questions can pose problems relating to safety and legality for librarians. Librarians should not let concerns about safety and legality interfere with their committment to provide patrons with the information they seek. Your patrons have a right to whatever information you can find on their question. For example, a patron asks how to build a still; how to convert a car to run on propane. You're not sure if it's legal or if it's safe. If the patron had asked whether it was legal or safe, then you should address that question and research that issue, but if they have asked for how to do it information and that is available, the patron has a right to it. Regarding propane conversion, BARC has on file a two page press release from the National LP Gas Association on the dangers of do-it-yourself conversion. But remember the vested interest of that association. Your patron has a vested interest also; it's expensive and there's a long wait for professional conversion. If there are problems of legality or safety, these will turn up in the course of research, and of course you would, and BARC would, pass that information along to the patron. But our primary responsibility is to answer the patron's question. So if it's the patron's business what he does with the information you might ask why the BARC form asks you to find out from your patron why they want the information. We don't ask you that to be judgemental or to pry. What the patron plans to do would really be none of our business were it not for the fact that we will research the question differently; we'll look for plans, illustrations, specifications if we know the patron plans to convert a car, drill for oil in his backyard (we haven't had that question) or build a still. So if your patron comes in with a vague interest in alcohol and you can't find what he's planning, send the question to us and we'll do the best we can. But it really helps us to provide useful information if we know how the patron plans to use it.

The best example I can think of came up in connection with the topic of enzymatic hydrolysis of cellulose. BARC received a question where the library wanted general information because the patron wanted to make gasohol. I sent some technical information

and cites to more technical material. I talked to a professor at UCB who said it was not backyard technology at this point. When the library got back to the patron, it turned out he was very happy with all the material I thought was too technical for his project, since it turned out he had been hired to design an industrial plant using the process. I'm not too sure how much confidence that story will build in this group regarding our alternative energy future, but it is a good example of why we ask what the patron plans to do.

These then are some of the kinds of questions BARC gets on alternative energy, our resources, and ethical position.

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SMALL GROUP DISCUSSIONS ON THE ROLE OF THE LIBRARY IN OUR ENERGY FUTURE

Librarians participating in small group discussions came up with many creative ideas. Ever practical, librarians suggested friends groups might help with funding. The following suggestions are a composite from the two day workshop.

INFORMATION

Librarians should keep informed on energy issues. They could set up a community energy resource file, publish a directory of people or groups active in alternative energy, or set up tours of alternative energy projects in the area. Libraries could sponsor or create energy questionnaires which could be distributed to schools, newspapers, etc.

BUILDINGS

Make buildings energy efficient and publicize it! Use solar energy in new buildings; apply for a DOE grant to retrofit old buildings. Set up a windmill on the roof. Have PG&E do an energy analysis of the building. Have your patrons work off fines on an energy bicycle which would generate electricity for the library! Open the library during daylight hours only. Use an electric bookmobile.

EXHIBITS AND DISPLAYS

Display aerial photos showing heat loss from homes. (The Spring, 1980 *RQ*, p. 214-215, describes an interesting project in the Oklahoma City area where thermograph photos on display in the library were used by over 500 homeowners to pinpoint areas of heat loss). Set up solar construction exhibits which could be obtained from contractors, architects, etc. Arrange electric car or still (moonshining) exhibit.

PROGRAMS

Children's programs could include workshops on conservation of energy, making solar or greenhouse models. The library could plan or sponsor an energy or solar fair; workshops for homeowners on energy efficiency, including a weatherstripping demonstration; or a crafts fair emphasizing quilts and energy saving clothing. Contact schools regarding energy projects and fairs; students could set up working projects, i.e. windmills or solar projects at the library. Invite speakers from clubs such as an electric car club, roofing or building companies, a nuclear power plant, or someone who has built a still or other project. Sponsor a conservation poster contest.

RECYCLING

Use the library as a recycling center.

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ALTERNATIVE ENERGY: A BASIC READING LIST

Compiled by Glenda Hooper, Bay Area Reference Center

"If I am content with little, then enough is as good as a feast."--Dean Swift

REFERENCE

Crowley, Maureen and Patricia Read, eds. *Energy: sources of print and nonprint materials.* (Neal-Schuman Sourcebook Series). New York: Neal-Schuman, 1979. $17.95.
Expansion of *Library Journal*'s annual "Energy Source Directory." Covers a wide variety of organizations, including publishers and distributors.

Energy: a guide to organizations and information resources in the United States. 2d ed. (Who's Doing What Series, No. 1). Claremont, CA: Center for California Public Affairs, 1978. $20.00 pb.
Provides a central source of information on the key organizations concerned with energy in the U.S. with emphasis given to organizations that influence, formulate, or administer policies affecting energy production, distribution and use, or that provide information of interest to the non-specialist.

McGraw-Hill Encyclopedia of Energy. New York: McGraw-Hill, 1976. $24.50.
Collection of 300 articles written by specialists which covers all aspects of energy from the economic and political to the environmental and technological. Much of the material was drawn from the *McGraw-Hill Encyclopedia of Science and Technology.*

Warren, Betty, ed. *The Energy and Environment Bibliography: access to information.* Rev. ed. San Francisco: Friends of the Earth Foundation, 1978. $3.50 pb.
Annotated list compiled, as the introduction states, "With the aim of furthering the understanding of the ecological imperative."

GENERAL

Baldwin, James Tennant and Stewart Brand, eds. *Soft Tech.* New York: Penguin, 1978. $5.00 pb.
Primarily reprints from *CoEvolution Quarterly.*

Bendixon, Terence. *Without Wheels: alternatives to the private car.* Bloomington: Indiana U. Press, 1975. $10.00.
Workable schemes to thwart the automobile.

Congdon, R. J., ed. *Introduction to Appropriate Technology: toward a simpler lifestyle.* Emmaus, PA: Rodale Press, 1977. $6.95 pb.
Collection of essays by economists, sociologists, engineers and others which describes specific ways in which people oriented technologies can be introduced within the existing social contexts of all countries, regardless of the level of their development.

de Moll, Lane and Gigi Coe, eds. *Stepping Stones: appropriate technology and beyond.* New York: Schocken, 1978. $14.50; $7.95 pb.
Philosophical pieces about the values and politics of appropriate technology intended as a companion volume to *Rainbook.*

Eccli, Sandy et al, eds. *Alternative Sources of Energy: practical technology and philosophy for a decentralized society.* Kingston, NY: Seabury Press, 1974. $8.95 pb.
Reprints from *Alternative Sources of Energy* magazine.

Farallones Institute. *The Integral Urban House: self-reliant living in the city.* San Francisco: Sierra Club Books (dist. by Scribners), 1979. $12.95 pb.
Relates the whys and the how-tos of creating a self sufficient house based on ecologically stable, resource conserving living systems.

Harper, Peter, Godfrey Boyle and the editors of *Undercurrents*, eds. *Radical Technology.* New York: Pantheon, 1976. $5.95 pb.
About technologies that could help create a more fulfilling society, with the growth of small scale technologies under workers' and consumers' control. *Undercurrents*, the British version of *Alternative Sources of Energy* magazine, espouses the ideal of technological organization as part of a total movement toward a new form of society.

Johnson, Warren A. *Muddling Toward Frugality: a blueprint for survival in the 1980s.* Boulder, CO: Shambhala Publications (dist. by Random House), 1978. $2.95 pb.
A book about scarcity--not how to prevent it, but how to gracefully adapt to it, once the inevitability of finite resources is accepted.

Leckie, James et al, eds. *Other Homes and Garbage: designs for self-sufficient living.* San Francisco: Sierra Club Books (dist. by Scribners), 1975. $9.95 pb.
A practical guide to environmental engineering, house design, generation of electricity, solar heating, waste handling and water supply.

Lovins, Amory B. *Soft Energy Paths: toward a durable peace.* New York: Harper and Row, 1977. $3.95 pb.
Presents consequences of choosing between a soft technology path (renewable energy sources) and the hard technologies (nuclear and fossil fuels) and argues that the system that seems socially more attractive is also cheaper and easier.

Marks, Vic, ed. *Cloudburst: a handbook of rural skills and technology.* 2d ed. Canada: Cloudburst Press (dist. by Madrona Publishers), 1977. $11.95 lib. bdg.; $5.95 pb.
--*Cloudburst 2.* 1975. Same price.
Practical handbooks--full of useful designs--for rural survival.

Merrill, Richard and Thomas Gage, eds. *Energy Primer: solar, wind and biofuels.* Updated and rev. ed. Menlo Park, CA: Portola Institute, 558 Santa Cruz Ave., Menlo Park, CA 94025, 1978. $7.95 pb (plus $1.00 mailing charge).
Comprehensive book about renewable forms of energy which includes background material, book reviews and hardware descriptions and sources.

Prenis, John, ed. *Energy Book #2: more natural sources and backyard applications.* Philadelphia: Running Press, 1977. $9.80 lib. bdg.; $5.00 pb.
#2, more technical than #1, has extensive sections on wind and solar energy and a third entitled *Methane, Plant Energy, Trash Power and Other Possibilities.* Latest developments and future possibilities.

Rain Editors. *Rainbook: resources for appropriate technology.* New York: Schocken, 1977. $15.00; $7.95 pb.
The best of *Rain* magazine.

Stobaugh, Robert and Daniel Yergin, eds. *Energy Future: report of the Energy Project at the Harvard Business School.* New York: Random House, 1979. $12.95.
Establishes an historical perspective, clarifies the terms of the current debate, and rationally advocates a genuine movement toward conservation and low technology solar.

Stoner, Carol Hupping, ed. *Producing Your Own Power: how to make nature's energy sources work for you.* New York: Random House, 1975. $3.95 pb.
A marriage of technical data and real experience for the do-it-yourself reader.

Todd, Nancy Jack, ed. *The Book of the New Alchemists.* New York: E.P. Dutton, 1977. $6.95.

Mostly reprints from the *Journal of the New Alchemists* (volumes 1, 2 and 3 now out of print), this collection of essays deals with the self sustaining, ecologically sound community.

PERIODICALS

Alternative Sources of Energy. ASE, Rt. 2, Box 90A, Milaca, MN 56353. $10/6 issues ($15 for institutions).

The contents, mostly reader contributed, include short book reviews, columns on new products and energy alternatives and material on the construction and use of alternative energy equipment.

Appropriate Technology. Intermediate Technology Development Group, 9 King St., London WC2E 8HN, England. (Subscriptions available through International Scholarly Book Service, P.O. Box 555, Forest Grove, OR 97116). $10/quarterly.

Shows simple ways of doing complex things for survival. Exact descriptions given for such techniques as making water pipes from bamboo, a large scale solar steam cooker, and a bicycle driven generator.

CoEvolution Quarterly. Point, Box 428, Sausalito, CA 94965. $3.50/single copy; $12/year.

Eclectic mix of articles, comments and detailed descriptions of hundreds of items, including books, tools, and information sources, that can simplify and improve life. A spinoff from the *Whole Earth Catalog.*

The Journal of the New Alchemists. The New Alchemy Institute, P.O. Box 47, Woods Hole, MA 02543. $10.00.

Each year the New Alchemists publish a journal of their most recent work and thoughts--a happy blend of scientific data, humor and news.

Mother Earth News. MEN, 105 Stoney Mountain Rd., Hendersonville, NC 28739. $12/bimonthly.

Enlightens city dwellers about the potentials and advantages of living in a more self sufficient manner. Articles are written with a downhome flavor and emphasize the possibilities more than the execution.

People and Energy. Center for Science in the Public Interest, 1518 R St., NW, Washington, DC 20009. $15.00/monthly.

News of citizen and government action in the areas of energy policy, conservation and technology. Editorial slant is that energy problems are solvable and individual citizen action is essential.

Rain, Journal of Appropriate Technology. Rain, 2270 N.W. Irving, Portland, OR 97210. $15/10 issues.

The masthead states: "*Rain* is a national information access journal making connections for people seeking more simple and satisfying lifestyles, working to make their communities and regions economically self-reliant, building a society that is durable, just and ecologically sound." Annotated listings of groups, contacts, books and other sources of information.

Self-Reliance. Institute for Local Self-Reliance, 1717 18th St. NW, Washington, DC 20009. $8/bimonthly ($15 for institutions).

Newsletter which presents news of urban decentralization and small scale technology activities.

INDEXING AND ABSTRACTING SERVICES USEFUL FOR FINDING INFORMATION ON ALTERNATIVE ENERGY SOURCES AND RESOURCES: A SELECTED LIST FOR PUBLIC LIBRARIES

Compiled by Anne Roughton, Bay Area Reference Center

INDEX/ABSTRACT	TYPES OF INFORMATION GENERALLY INDEXED	EXAMPLES OF INFORMATION FOUND UNDER "SOLAR," "GEOTHERMAL," "WIND POWER," "GASOHOL," AND "AUTOMOBILES, ELECTRIC" IN RECENT CUMULATED VOLUME OF INDEX
Applied Science and Technology Index. New York: H.W. Wilson, 1958- . Monthly, with annual cumlation.	International scope. Indexes 200 English language journals. Articles indexed are usually of a highly technical nature, although there are some materials of general interest.	There were 7 pages of indexed articles on solar related subjects such as "Solar Batteries," "Solar Furnaces," "Solar Water Heaters." Under "Geothermal Energy" 27 items were listed on topics such as geothermal power plants, engineering technology, and U.S. government policy. 14 articles were listed under "Automobiles, Electric" from journals including *Modern Metals* and *Iron Age*. "Wind Power" had 45 articles listed. A few items on gasohol were found under "Gasoline-Alcohol Mixtures."
Biological and Agricultural Index. New York: H.W. Wilson, 1945- . Monthly, with annual cumulation.	Not a particularly good information source--has a few articles on alternative energy sources as they relate to agriculture.	12 articles were listed under "Solar Heating," e.g. one on a solar organic hive heater. "Wind Power" produced 5 articles all highly technical in nature. There was one item under "Electric Vehicles," and nothing under "Gasohol" or "Geothermal."
Business Periodicals Index. New York: H.W. Wilson, 1958- . Monthly, with annual cumulation.	Good source for finding short articles about the business and technology of alternative energy sources.	Looking at the general subject "Solar" there were four pages of references under subjects such as "Solar Collectors" (16 articles), "Solar Energy Industry" (24 articles), "Solar Power Plants" (10 articles), etc. There were 19 items under "Geothermal Energy," on topics such as the technology of drilling steamwells, and new geothermal plants being developed here and abroad. "Automobiles, Electric" produced 18 articles from journals including *Automotive News* and *Automotive Industries*. There were 18 articles on "Alcohol as Fuel" and 6 on "Wind Power."
CIS/Index to Congressional Publications and Public Laws. Washington, DC: Congressional Information Service, 1970- . Monthly, with annual and quinquennial index cumulations.	Excellent source for tracking alternative energy related reports/documents which are issued by the House, Senate, and Joint Committees and Subcommittees of the U.S. Congress.	In the index section under "Solar Energy," "Geothermal Resources," and "Wind Energy" there were numerous references to current congressional activity relative to each. Information about electric autos was buried under the broad heading "Automobiles and Automobile Industry." Under "Gasohol" there was one reference to the Gasohol Motor Fuel Act.

24 N.B. CIS/Index is available online through SDC's Orbit IV.

INDEX/ABSTRACT	TYPES OF INFORMATION GENERALLY INDEXED	EXAMPLES OF INFORMATION FOUND UNDER "SOLAR," "GEOTHERMAL," "WIND POWER," "GASOHOL," AND "AUTOMOBILES, ELECTRIC" IN RECENT CUMULATED VOLUME OF INDEX
Education Index. New York: H.W. Wilson, 1929- . Monthly, with annual cumulation.	Very limited number of articles on alternative energy sources. Articles found would be of interest mainly to elementary and high school teachers and students.	Under "Solar Energy" there were 10 general articles on topics such as planning a high school curriculum, and future job opportunities in the field. Under "Solar Collectors" there were 5 items listed, including an article on how to make a collector. Looking up "Geothermal Resources," "Automobiles, Electric," and "Wind Power" there was one article on each topic.
Energy Abstracts. New York: Engineering Index, Inc., 1979- . Monthly. ($310/yr.) N.B. *Energy Abstracts* database tapes, issued 12x/yr. are available from Engineering Index, Inc.	This new index provides worldwide coverage of energy related literature from diverse scientific and technological fields. Aimed at the scientist/technician/researcher.	
Energy Information Abstracts. New York: Environment Information Center, Inc., 1976- . 10x/yr. ($400/yr.) N.B. *Energy Information Abstracts* is available online as *Energyline* through Lockheed's DIALOG and SDC's ORBIT IV.	Indexes 1000 English language, energy related international periodicals, plus numerous government reports/documents, conference papers, monographs, etc., dealing with energy resources, consumption and conservation. Coverage is broad enough to be useful to the technician and the layperson.	All items were arranged in 21 classified sections. One entire section was devoted to "Solar Energy" related items. Materials about geothermal resources and wind power were included in the section on "Unconventional Resources," and information on electric autos was found in the "Transportation Consumption" section. Each issue was indexed by subject, SIC code, source and author.
The Energy Index. New York: Environment Information Center, Inc., 1973- . Annual. (1979 v/$125).	Annual cumulative index to *Energy Information Abstracts.* The index also reviews major energy events of the year, provides original articles, gives a legislative overview and contains other yearbook features.	

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INDEX/ABSTRACT	TYPES OF INFORMATION GENERALLY INDEXED	EXAMPLES OF INFORMATION FOUND UNDER "SOLAR," "GEOTHERMAL," "WIND POWER," "GASOHOL," AND "AUTOMOBILES, ELECTRIC" IN RECENT CUMULATED VOLUME OF INDEX
Energy Research Abstracts (ERA). Oak Ridge, TN, Technical Information Center, U.S. Dept. of Energy, 1976- . 24x/yr., with semiannual and annual cumulated indexes. ($184/yr.) Federal, state and municipal agencies concerned with energy development may obtain ERA free; send inquiries to Technical Information Center, P.O. Box 62, Oak Ridge, TN 37830. N.B. All references in the *Energy Research Abstracts* are included in the DOE Energy Database which is available online through DOE/RECON.	Provides abstracting and indexing coverage of all scientific and technical reports, journal articles, conference papers and proceedings, books, patents, theses, and monographs generated by the DOE. Abstracts are accessible through a corporate index, an extensive subject index, and a contract number index.	*Jan-June 1978 Semiannual Index* had 50 pages (approximately 68 items per page) listing publications concerned with various aspects of solar energy. There were 11 pages of geothermal related items, 2½ pages of "Electric-Powered Vehicles", and 1½ pages of "Wind Power."
Funk and Scott Index of Corporations and Industries, United States. Cleveland, PREDICASTS, Inc., 1960- . Weekly, with quarterly and annual cumulations. N.B. The information contained in *F&S Index, U.S.* is in the F&S Index of Corporations and Industries database which is available online through Lockheed's DIALOG and SDC's ORBIT IV.	Good source for short items dealing with up-to-date information on the business of energy. Index is aimed at businesspeople. Indexes articles from over 750 financial and trade magazines, newspapers, business services and bank newsletters.	SIC codes were used to locate information. In section #29001 60 "Solar Energy" there were 1½ columns of articles listed under subtopics such as "Product Design and Development," "Market Information," and "Resources and Resource Use" (included items with projections to year 2020). There were sections for "Solar Cells," "Solar Energy R and D," "Solar Generators," "Geothermal Energy," "Geothermal Mining," "Gasohol," etc. Section #37111 43 "Autos, Electric" listed items about companies which now market and/or plan to market electric vehicles; also included projections to the year 2000.

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INDEX/ABSTRACT	TYPES OF INFORMATION GENERALLY INDEXED	EXAMPLES OF INFORMATION FOUND UNDER "SOLAR," "GEOTHERMAL," "WIND POWER," "GASOHOL," AND "AUTOMOBILES, ELECTRIC" IN RECENT CUMULATED VOLUME OF INDEX
Funk and Scott Index, International; industries, countries, companies. Cleveland: PREDICASTS, Inc., 1970- . Monthly, with annual cumulation. N.B. The information contained in *F&S Index, International* is in the F&S Index of Corporations and Industries database which is available online through Lockheed's DIALOG and SDC's ORBIT IV.	Worldwide up-to-date information on the business of energy.	This is a good information source for questions about alternative energy sources being developed in various countries, e.g. in the Brazil section under SIC #29111 41 "Gasohol" there were a number of items detailing the country's new government financed gasohol program.
General Science Index. New York: H.W. Wilson, 1978- . Monthly, with annual cumulation.	Articles indexed would be useful for high school students or for adults interested in general reading on alternative energy sources.	Under "Solar Energy" there were 25 articles, mostly 2-3 pages in length, from magazines such as *Nature* and *Science*. There were 8 items under "Wind Power," 3 under "Geothermal Resources," 2 under "Gasoline-Alcohol Mixtures," and one on "Automobiles, Electric."
The Magazine Index. Los Altos, CA: Information Access Corp., 1976- . Monthly ($1480/yr., in microform). N.B. *The Magazine Index* is available online through Lockheed's DIALOG.	This is an excellent one-stop source for non-technical articles culled from 374 popular magazines. All items indexed since 1976 (starting date of service) are in one author/subject/title alphabet.	Under the general category of "Solar" one found 55 columns of articles, the majority under headings "Solar Energy," "Solar Energy Research," and "Solar Heating." There were 5½ columns (66 articles) on "Gasohol," 7 columns of articles on "Automobiles, Electric," 5 columns on "Wind Power," and 32 articles on "Geothermal Resources."
Reader's Guide to Periodical Literature. New York: H.W. Wilson, 1900- . Semimonthly, with annual cumulation.	General interest, non-technical articles for the student or layperson.	There were 2 pages of solar references under headings such as "Solar Collectors," "Solar Cookers," "Solar Energy" (36 articles), etc. There were fewer items under "Geothermal Resources" (4 articles), and "Wind Power" (9 articles). 13 articles on gasohol were found under "Alcohol as Fuel," and 7 articles under "Automobiles, Electric."

Commercial Sail, by Patricia Lawrence

BIBLIOGRAPHY

TECHNICAL PAPERS:

Azad, S. A. The Calculation of Passage Times of a Sailing Ship by Simulated Weather-Routing. Presented at symposium on The Future of Commercial Sail: Royal Institution of Naval Architects, London, 28 November 1975.

Azad, S. A. "The Need for Investment in Wind Propelled Ships." *

Beebe-Center, J. G. and R. B. Brooks. On the Stability of Sailing Vessels. Presented at Society of Naval Architects and Marine Engineers, Chesapeake Section, March 1966.

Carson, Jay. Sailing Bulk Carrier Design. Presented at Society of Naval Architects and Marine Engineers, New England Section, November 1976.

Couper, Prof. A. D., Prof. J. King, P. B. Marlow. "An Evaluation of Commercial Sail." **

Hook, Christopher. Commercial Transport by Sail. The Ancient Interface VIII, Proceedings of the Eight AIAA Symposium on The AER/Hydronautics of Sailing, Stanford University, 5 March 1977.

Jonas, P. J. "Energy Conservation Perspectives." **

King, Prof. J. F. R. "A Technical Description and Performance Analysis of the DynaShip." ***

Lawrence, Hugh G. "A Modern Fore and Aft Rigged Sailing Cargo Ship." ***

Lawrence, Hugh G. The Western Flyer Project, A Modern Sailing Cargo Ship. Presented at Society of Naval Architects and Marine Engineers, San Francisco Section, September 1976.

Mankabady, Dr. S. "A Legal Look at Sailing Ships." *

Miles, A. S. "The Economics of Commercial Sail." ***

Nance, Air Commodore C. T. "The Role of the Engineer in the Windship Revolution." **

Nance, Air Commodore C. T. "Untitled Paper." Presented at Liverpool Polytechnic Symposium on the Technical and Economic Feasibility of Commercial Sailing Ships. Liverpool, England, February 1976.

Nance, Air Commodore C. T. Has the Time Come for the Re-Birth of Sail? Proceedings of International Conference on Hovercraft, Hydrofoil and Advanced Transit Systems, Amsterdam, May 1976.

Painting, D. J. "The Meteorological Office Marine Archive and Its Use to Describe Ocean Climate." **

Phelan, Cpt. C. H. "Sailing Vessels-Training Considerations." **

Prager, M. The Speed of Travel of Sailing Vessels on Long Trips. Annalen der Hydrographie und Maritime Meteorologie, January, 1905. (in German)

Prolss, Wilhelm. The Economics of Wind-Driven Merchant Ships. Jahrbuch der Schiffbautechischen Gesellschaft, Vol. 61, 1967.

Schenzle, P. "Comparative Sailing Speed in Wind Propulsion." *

Scher, R. An Analysis of the Economic Potential of Commercial Sailing Ships. University of Michigan, 1973.

Schrerer, J. Otto. An Overview of Sailing Yacht Propulsion. Presented at Society of Naval Architects and Marine Engineers, New York Metropolitan Section, January 7, 1976.

Wagner, B. Sailing Ship Research at the Hamburg University. *

Wagner, B. Calculation of the Speed of Travel of Sailing Ships. Jahrbuch der Schiffbautechnischen Gesellschaft, Hamburg, Vol. 61, Berlin: Springer Verlag, 1967.

Warner, William and Miklos M. Kossa. "Updating an Ancient Art--Research and Development Toward Modern Wind-Powered Cargo Ships." Proceedings, Second Star Symposium, Society of Naval Architects and Marine Engineers, San Francisco, May 1977.

Warner, P. R. and W. J. Hood. "A Commercial Sailing Ship for the South West Pacific Ocean." ***

Wellicome, J. "A Broad Appraisal of the Economic and Technical Requisites for a Wind Driven Merchant

Willoughby, Capt. R. M. "The Windrose Ship--Why Square Rig?" **

Wolf, Douglas and Roy Neuman. Heeled and Yawed Characteristics of Modern Sailing Cargo Vessels. Graduate Thesis, Webb Institute of Naval Architecture, 1977.

Woodward, John B., Robert F. Beck, Robert Scher, Charles M. Card. Feasibility of Sailing Ships for the American Merchant Marine. University of Michigan, 1975.

Wynne, J. B. "Sails for the Auxiliary Propulsion of a VLCC Trading on the Northern Europe-Persian Gulf Route." ***

---

* Presented at Symposium on Technical and Economic Feasibility of Commercial Sailing Ships, Liverpool Polytechnic, Liverpool, England, February, 1976.

** Presented at Symposium on Commercial Sail, Ship and Marine Technology Requirements Board of the Department of Industry, U. K., London, June 14, 1979.

*** Presented at the Symposium on The Future of Commercial Sail, Royal Institution of Naval Architects, London, November 28, 1975. Papers collected in Occasional Publication No. 2, The Future of Commercial Sail, Royal Institution of Naval Architects, 1976.

PERIODICALS:

"The Wave of the Future: Shipping by Sail." Business Week, 21 January 1980, p. 66-67.

"The Wind is Free." Containerisation International, August 1979, p. 29.

Greenhill, Basil. "The Sailing Ship in a Fuel Crisis." Ecologist, September 1972.

King, John. "A Forecast for Sailing Ships." Futures, December 1976, p. 517.

"Sailing Ships Return." Japan Economic Journal, August 7, 1979.

"The Economics of Sail." The Journal of Navigation, May 1977.

Ovechka, Greg. "Sail Cargo Ships to Arrive in 1980's?" Marine Engineering/log, February, 1980.

"Commercial Sailing Ship: Phoenix or Ashes?" Marine Week, 19/26 December 1975, p. 17.

"Give Sail a Chance." Marine Week, 5 November 1976, p. 13-15.

"Enter Windrose." Marine Week, 10 February 1978, p. 18-19.

"Sailing into the 21st Century." Marine Week, 22/28 June 1979, p. 36.

"Sail-Possible Future." Marine Week, 7 September 1979.

"Commercial Sail, the Prospects." Marine Week, 2 March 1979.

"Raising the Wind." The Motorship, May 1978, p. 5.

"MarAd Awards Contract for Sailing Ship Study." Maritime Reporter/Engineering News, 1 January 1980.

Orsini, Stephen D. "Wind-Powered Cargo Ships May Be on the Horizon." National Fisherman, 30 April 1978, p. 76-31.

Levitt, Michael. "Banking on the Wind." Nautical Quarterly, #5, p 61-79.

"Square Rigged Bulk Cargo Sailing Ship Design." The Naval Architect, March 1978.

Close, A. M. "Commercial Sailing Vessels--An Economic Assessment." The Naval Architect, September 1978, p. 166.

"Back with the Wind." Newsweek, 5 January 1976, p. 65.

Taylor, Donald M. "Jack-up with Sails." Ocean Industry, April 1978, p 37-40.

Lawrence, Hugh G. "Every Wind a Trade Wind." Oceans, July 1974.

Lawrence, Hugh G. "Letters." Oceans, March 1975, p. 70.

Lawrence, Hugh G. "Sailing Cargo Ships." Oceans, March 1978, p. 57-62.

Perry, Mike. "Rigged for Sail." Sail, August 1978, p 61-65.

Lones, Trevor. "Getting the Wind Up Over Future Oil Supplies." Seatrade, December 1978, p. 77-81.

Lones, Trevor. "Shipshape the Way Hugh Likes It." Seatrade, May 1979, p. 101-103.

"Can the Tall Ships Return?" Science News, Vol 116, 7 July 1979, p. 6.

"Alternative Energy Concepts." Ship and Boat International, June 1978, p. 15.

Bergeson, Lloyd. "Sail Power for the World's Cargo Ships." Technology Review (MIT), March/April 1979, p. 22-36.

"Power From the Wind." Surveyor (American Bureau of Shipping), August 1978, p. 6.

Woodward, John B., Robert F. Beck, Robert Scher, Charles M. Cary. "Feasibility of Sailing Ships from the American Merchant Marine." Technium, Ann Arbor: University of Michigan, Number 2, 1975. (Summary of feasibility report.)

"High Cost of Fuel Revives Interest in Commercial Sailing Vessels." Traffic World, 15 September 1975, p. 105-106.

NEWSPAPERS:

"A Return to Sail, Proposed for Cargo Vessels." New York Times, May 1, 1979, Sec. C, p. 1-4.

"Back to Subsonic Sail Power." Times (London), January 25, 1976, p. 15.

"Cargo Vessel Owner Rerigs Ship for Sail." Journal of Commerce, July 25, 1979.

"Commercial Sail-Hauling in the Main Sheet." Lloyd's List, August 4, 1978, p. 10.

deChair, Graham. "Comeback for Commercial Sailing?" The Christian Science Monitor, September 6, 1978, p. 17.

"Experts Propose Return to Sail Power for Good Part of Merchant Marine." Journal of Commerce, July 29, 1979, p. 33.

McDonald, Robert. "Sailpower Awaits a Sponsor." Financial Times (London), August 8, 1979.

Miner, Jak. "A New Clipper?" The Christian Science Monitor, July 7, 1976, p. 25.

North, Richard. "Oil Crisis Can Bring Back Sails." The Observer (London), June 24, 1979.

"Return of the Tall Ships?" Journal of Commerce, July 13, 1979, p. 4.

"The Romance of Sail." Lloyd's List, April 24, 1979, p. 4.

"Schooner to be Entered in Commercial Trading." Journal of Commerce, June 1, 1979.

"Whistle Up the Wind." Manchester Guardian, May 4, 1979.

"Wind-Powered Vessels May Be Re-Introduced." Lloyd's List, June 15, 1979, p. 3.

BOOKS:

Colton, J. F. Windjammers Significant, Dutton, 1937.

Derby, W. L. A. The Tall Ships Pass, J. Cape, London, 1937.

Hurst, A. A. Square-Riggers, The Final Epoch, 1921-1958, Teredo Press, Sussex, 1972.

LeScal, Yves. The Great Days of the Cape Horners, Souvenir Press, London, 1966.

Underhill, Harold. Deep-Water Sail, Brown, Sons & Ferguson, 1952.

Underhill, Harold. Masting and Rigging, Brown, Sons & Ferguson, 1946.

Underhill, Harold. Sailing Ships Rigs and Rigging, Brown, Sons & Ferguson, n.d.

FILMS:

Wind Ship. Neil Andrews, producer. Program Series: "New Wave." Canadian Broadcasting Corporation, shown September 29, 1975.

* * * * *

ELECTRIC VEHICLES - SOURCES OF INFORMATION

PUBLICATIONS:

Electric Vehicle News. Quarterly. $10.00/year. P.O. Box 533, Westport, CT 06880.

Shacket, Sheldon R. *The Complete Book of Electric Vehicles.* Northbrook, IL: Domus Books, 1979. $14.50; $7.95 pb.
This profusely illustrated volume covers electric motors, basic design, the history and future of electric vehicles. There are pictures and information on many specific vehicles, including home built vehicles. A list of manufacturers and associations is included.

State-of-the-Art Assessment of Electric and Hybrid Vehicles. Cleveland, OH: National Aeronautics and Space Administration--Lewis Research Center, 1978. For sale by NTIS. $28.00 pb. (HCP/M1011-01).
This is a technical, analytical summary of worldwide electric vehicle research. It covers not only advantages, but also problems and disadvantages of electric vehicles.

Wakefield, Ernest H. *The Consumer's Electric Car.* Ann Arbor, MI: Ann Arbor Science Publishers, Inc., 1977. $9.95 pb.
The author feels the electric car is the car of our future. His book includes information on basic electricity, the design of electric vehicles and brief mention of some novel ideas such as wind driven and solar powered electric vehicles.

ORGANIZATIONS:

Electric Auto Association of California. John Newell, 1249 Lane St., Belmont, CA 94002.
This non-profit organization, founded in 1967, publishes a monthly newsletter. Chapters meet at various locations throughout California. Contact John Newell for a sample newsletter, brochure on the association and list of chapter meetings.

Electric Vehicle Council. 1111 19th St. NW, Washington, DC 20036.
The council publishes a 60 page pocket sized guide to electric vehicles--*Electric Vehicle Mini-Guide.* One copy is free.

SOLAR ENERGY INFORMATION SOURCES

Compiled by Jeannette E. Glynn

Information Resources Consultant

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I. SOLAR ENERGY. BIBLIOGRAPHIES.

U.S. Energy Research and Development Administration (ERDA). *Solar Energy; a bibliography.* 2 v., v. 1: Citations; v. 2: Indexes. Oak Ridge, TN, ERDA, 1976. This bibliography goes back as far as useful references could be obtained and is current through 1975.

_____. *Solar Energy Update.* U.S. DOE, Technical Information Center. Monthly. $27.50/year. Order from NTIS.
Updates *Solar Energy; a bibliography.*

Solar Energy Index. Mary E. Beecher, ed. Tempe, Arizona State University, 1975. $135.00. Order from Pergamon Press.
Update planned for Spring 1980.

Government Reports Announcements and Index. Annual Index in 6 v. Biweekly. $245.00/year. Order from NTIS.
Important because many DOE reports are not in the *Monthly Catalog.*

National Solar Heating and Cooling Information Center (hereafter referred to as NSHACIC), Box 1607, Rockville, MD 20850, 800-523-2929.

Solar Bibliography. DC 136, 4th ed. December 1979. 3p. Free.

Reading List for Solar Energy. DC 107, 9th ed. April 1979. 6p. Free.

Solar Energy Reading List for Children. DC 149, 1st ed. April 1979. 2p. Free.

Solar Energy Reading List for Young Adults. DC 150, 1st ed. April 1979. 2p. Free.

Solar Energy Publications Available from the Government Printing Office. DC 123, 4th ed. April 1979. 3p. Free.

Synergy; a directory of energy alternatives. Box 4790, Grand Central Station, New York, NY 10017. Semi-annual. $20.00 (libraries), automatic repeat until canceled, otherwise, $24.00.

Warren, Betty. *The Energy and Environment Bibliography: access to information.* Friends of the Earth Foundation, 124 Spear St., San Francisco, CA 94105. 1978. $3.50.

I. SOLAR ENERGY. DATA BASES.

The U.S. Department of Energy's RECON (Remote Console) Information System contains up-to-date bibliographic references to 2 million journal articles, technical reports, conference papers and proceedings, books, theses, translations, patents, pamphlets and films. The data bases that contain information relevant to solar energy in RECON are:

Energy Data Base (EDB). "Broadly stated, the Energy Data Base includes all information of interest to DOE... Selection is based on subject content, nothing is excluded solely on the basis of form, origin, or language." Over 10,000 periodicals are scanned, including *Time, Newsweek, Mother Earth News, Solar Age.*

Federal Energy Data Base (FED). For efficient access to energy statistics. The Energy Information Administration of DOE produces nearly 80 statistical publications. Information from these publications are in this data base.

General and Practical Data Base (GAP). Produced by DOE Technical Information Center. Developed primarily to support the information activities of DOE's Energy Extension Service. GAP includes popular scientific, technical and "how-to-do-it" information.

Research in Progress Data Base (RIP). Covers all energy sources, fossil, nuclear, and unconventional; electric power generation, transmission, distribution and storage; energy conservation and utilization including heating and cooling, lighting, industrial processes, transportation, agriculture, etc.; economic and legal aspects, resources exploration, mining, processing and reserves studies; and basic and applied research and engineering development.

National Referral Center Data Base (NRC). The NRC file is a non-bibliographic file containing descriptions of organizations qualified and willing to answer questions on virtually any science or technology, including the social sciences. The National Referral Center of the Library of Congress has supplied the NRC data base. It may be accessed by keywords, geographical code, approval date, and information date.

The U.S. Department of Energy Library, 333 Market St., San Francisco, CA 94105, will conduct one free search.

Western Regional Information Service Center (WRISC), Lawrence Berkeley Laboratory, Building 50, Room 130, Berkeley, CA 94720, 415-486-6307, provides computerized search services in energy, and has access to RECON. Fees: $20.00/hour for DOE contractors, $22.00 for federal agencies and $23.00 for others. Most retrospective searches cost $25.00 to $50.00.

I. SOLAR ENERGY.

ANNUALS.

Annual Review of Solar Energy. Solar Energy Research Institute (SERI). Paper $9.00, microfiche $3.00. Order from NTIS.

CATALOGS.

Solar Age Catalog; a guide to solar energy knowledge and materials, from the editors of *Solar Age* magazine. Dover, NJ, Solar Age, 1977.

Solar Age Resource Book: the complete guidebook to the dramatic power of solar energy. New York, Everest House, 1979. $9.95.

DIRECTORIES. BIBLIOGRAPHIES.

NSHACIC. *Solar Directories.* DC 126, 3d ed. June 1979. 2p. Free.

DIRECTORIES.

California Solar Business Directory. Solar Business Office (SBO), 921 Tenth St., Sacramento, CA 95814. 1980. $10.00.

Solar Energy Directory. Phoenix, AZ, Centerline, 1978. $12.50.

Illinois Solar Energy Directory. Springfield, IL, Illinois Institute of Natural Resources, 1980.

NSHACIC. *Manufacturers of Solar Equipment.* (Call NSHACIC for names of manufacturers in your area.)

_____. *Distributors of Solar Equipment.* (Call NSHACIC for names of distributors in your area.)

SEM. Solar Engineering Master Catalog and Solar Industry Index. Dallas, Solar Engineering Publishers, Inc., 1978. $15.00.

Synerjy. *Manufacturers and Distributors - Solar.* New York, Synerjy. $3.50.

_____. *Wind, Water and Other Electric.* New York, Synerjy. $2.50.

HANDBOOKS.

Solar Energy Handbook. Paul Fleck, ed. Special California ed. Pasadena, CA, Time-Wise Pub., 1977.

PROCEEDINGS. BIBLIOGRAPHIES.

NSHACIC. *Solar Energy Proceedings.* DC 148, 1st ed. March 1979. 3p. Free.

Proceedings in Print. Barbara A. Spence, ed. Arlington, MA. 4 x/year, with a separate annual cumulative index.

BOOKS

Alves, Ronald. *Living with Energy.* New York, Penguin, 1978. $5.95.

Congdon, R.J. *Introduction to Appropriate Technology; toward a simpler life-style.* Emmaus, PA, Rodale, 1977. $6.95.

Energy Book 1; natural sources and backyard applications. John Prenis, ed. Philadelphia, Running Press, 1975. $4.00.

Energy Book 2; more natural sources and backyard applications. John Prenis, ed. Philadelphia, Running Press, 1977. $5.00.

I. SOLAR ENERGY.

BOOKS. (continued)

Ewers, William L. *Solar Energy; a biased guide.* Rev. ed. Chicago, Domus, 1979. $4.95.

Leckie, Jim. *Other Homes and Garbage - Designs for Self-Sufficient Living.* San Francisco, Sierra Club, 1975. $9.95.

Wallace, Daniel. *Energy We Can Live With: approaches to energy that are easy on the earth and its people.* Emmaus, PA, Rodale, 1976. $3.95.

PERIODICALS. BIBLIOGRAPHIES.

NSHACIC. *Solar Energy Newsletters.* DC 109, 4th ed. September 1978. 2p.

California Energy Commission (CEC) Library. *Serials List,* December 1, 1979. A list of over 300 periodicals received by the CEC Library, 26 of which are on solar energy.

PERIODICALS.

Advanced Solar Energy Technology Newsletter. 1609 West Windrose, Phoenix, AZ 85029. Monthly. $60.00/year.

Alternative Sources of Energy. 107 S. Central Ave., Milaca, MN 56353. Bimonthly. $15.00.

New Mexico Solar Energy Association. *Southwest Bulletin.* Box 2004, Santa Fe, NM 87501. Monthly. $20.00 (libraries). Dues: $10.00, includes one year's subscription.

Northern California Solar Energy Association Newsletter. Box 1056, Mountain View, CA 94042. Monthly except August. Dues: $10.00, distributed at no cost to members, additional copies $.50 each.

Rain: journal of appropriate technology. Rain Umbrella, Inc., 2270 NW Irving, Portland, OR 97210. 10 x/year. $15.00/year.

Solar Age. American Section, International Solar Energy Society, Inc., Box 4934, Manchester, NH 03108. Monthly. $20.00/year.

Solar Energy; the journal of solar energy science and technology. (International Solar Energy Society). $140.00 (libraries). The Subscription Fulfillment Manager, Headington Hill Hall, Oxford OX3 OBW England.

Solar Energy Digest. Box 17776, San Diego, CA 92117. Monthly. $35.00.

Solar Energy Intelligence Report. Business Publisher, Inc., Box 1067, Silver Spring, MD 20910. Weekly. $90.00/year, $50.00/six months.

Solar Engineering Magazine. Solar Energy Industries Association, 8435 N. Stemmons Freeway, Suite 880, Dallas, TX 75247. Monthly. $15.00/year.

Solar Life. Solar Energy Institute of North America, 1110 6th St. NW, Washington, DC 20001. Free to members, $20.00/year, nonmembers.

Solar Utilization News. Alternate Energy Institute, Box 3100, Estes Park, CO 80517. Monthly. $15.00/year (libraries).

Solar Utilization News. Solar Utilization Network, 121 Chestnut St., Philadelphia, PA 19106. Quarterly. $175.00/year.

I. SOLAR ENERGY.

PERIODICALS. (continued)

Sun Times. Solar Lobby, 1001 Connecticut Ave. NW, Fifth Floor, Washington, DC 20036. Monthly. $15.00/year.

Sunworld. (International Solar Energy Society) Subscriptions for nonmembers available from Pergamon Press. Bimonthly. $12.00/year.

EDUCATION

Cook, Jeffrey, "Solar Education: the roots of a profession," in *The Solar Age Resource Book*, pp. 49-50.

SERI. *National Solar Energy Education Directory.* SERI S/N 061-000-00368-1. $5.50. Order from Supt. of Documents, U.S. Govt. Print. Office, Washington, DC 20402.

_____. *Solar Energy Technical Training Directory.* SERI/SP-84-282. Free. Distributed by NSHACIC.

NSHACIC will provide a list of schools with courses in solar energy in California, free, upon request.

SOLAR ENERGY. GOVERNMENT. LOCAL.

BIBLIOGRAPHIES.

City of Davis. *List of Available Publications and Information.* July 1979. 4p. Free. City of Davis, 226 F St., Davis, CA 95616, 916-756-3740.*

NSHACIC. *Bibliography on Solar Communities.* DC 141, 1st ed. September 1978. 2p. Free.

ORGANIZATIONS.

Institute for Local Self-Reliance. 1717 18th St. NW, Washington, DC 20009, 202-232-4108.
Write for their list of publications.

MATERIALS FOR LOCAL OFFICIALS.

Capturing the Sun's Energy; opportunities for local government. Western Solar Utilization Network, California Office, 1111 Howe St., Sacramento, CA 95825, 916-920-7623. Free.

Solar Handbook for Local Government Officials. League of California Cities Solar Project, 1400 K St., Sacramento, CA 95814, 916-444-5790. $10.00.

DAVIS, CALIFORNIA

Davis Energy Conservation Report; practical use of the sun. (Final report) April 1977. $12.00. Order from City of Davis.*

Reprints of the following are available from the City of Davis:*

"Davis, California, Ordinance Sets Energy Conservation Performance Standards for Residential Construction." *The Municipal Attorney,* March 1976. 3p.

McGregor, Gloria Shepard. "Davis, California Implements Energy Building Code." *Practical Planner,* February 1976. 4p. $1.00.

_____. "A New Energy Source: natural design for energy generation." January 1979. 14p. $2.00.

Reprints of the following are available from the City of Davis:* (continued)

Rancer, Michael D. "Energy Conservation in New Residential Buildings." Municipal Management Innovation Series: No. 17. Washington, DC: International City Management Association, April 1977. 8p.

OTHER PUBLICATIONS

Energy Efficient Community Planning: a guide to saving energy and producing power at the local level. JG Press, Box 351, Emmaus, PA 18049. $12.00.

U.S. DOE. Assistant Secretary Policy and Evaluation. Division of Environmental and Institutional Impacts Evaluation. *Local Government Energy Activities.* 3 v. July 1979. DOE/PE-0015/3. Paper: v. 1: $5.95. v. 2: $9.00. v. 3: $9.00. Microfiche: each volume: $3.00. Available from NTIS.

NSHACIC. *Solar Programs in Low-Energy Communities.* 6p. Excerpted from Holzman, David. *People and Energy.* Free.

SOLAR ENERGY. GOVERNMENT. STATE.

NSHACIC. *State Energy/Solar Offices.* SS 113, 1st ed. July 1979. 4p. Free

California Public Utilities Commission. *Financing the Solar Transition; a report to the California Legislature.* January 2, 1980. (PUC Order Instituting Investigation No. 42). 77p. and Appendices. Free.

California Public Utilities Commission. *Investigation on the Commission's Own Motion Into the Feasibility of Establishing Various Methods of Providing Low-Interest, Long Term Financing of Solar Energy Systems for Utility Customers.* Decision No. 91272. January 29, 1980. Interim Order.

California Energy Commission (CEC). *Publications Catalog.* Annual cumulation plus monthly updates. CEC, 1111 Howe St., Sacramento, CA 95825. Free.

Solar Business Office (SBO). *Sources of Information on Solar Energy.* 2p. SBO, 921 Tenth St., Sacramento, CA 95814, 916-445-0970. Free.

SOLAR ENERGY. LAW AND LEGISLATION.

Congressional Record Abstracts. Federal Energy ed. Capitol Services, Inc., CST, 511 2d St. NE, Washington, DC 20002, 202-546-5800.

A Forum on Solar Access. Proceedings of a Forum on Solar Access. New York State Legislative Commission on Energy Systems, July 28, 1977. World Trade Center, New York, NY. Available from NSHACIC.

Protecting Solar Access for Residential Development: a guidebook for planning officials. 1979. American Planning Association. U.S. HUD, Office of Policy Development and Research, in cooperation with U.S. DOE. Free. Available from NSHACIC.

Solar Law: present and future, with proposed forms. Shepards, Inc., of Colorado Springs, Box 1235, Colorado Springs, CO 80901.
With annual pocket supplement.

Solar Energy Legal Bibliography. Final Report. March 1979. SERI/IR-62-069. 169p.

I. SOLAR ENERGY. LAW AND LEGISLATION. (continued)

State Solar Legislation, as of January 1979. U.S. HUD, in cooperation with the U.S. DOE. 15p. Free. Available from NSHACIC.

Eisenhard, Robert M. *A Survey of State Legislation Relating to Solar Energy.* 2 v. 1974-75 (NBSIR 76-1082): $4.50. 1976 (NBSIR 77-1297): $10.75. Available from NTIS, 5285 Port Royal Road, Springfield, VA 22161.
Compendium of state solar legislation, through 1976.

Turning Toward the Sun: V. 1 Abstracts of State Legislature Enactments of 1974 and 1975 Regarding Solar Energy. Denver, National Conference on Legislatures Energy Task Force. 38p. (PB252 836). Available from NTIS.

Solar Law Reporter. Denver, SERI. Bimonthly. $12.00/year.

CODES

Model Document for Code Officials on Solar Heating and Cooling of Buildings. 2d Draft. September 1979. Prepared jointly by Council of American Building Officials, Building Officials and Code Administrators International, Inc., International Conference of Building Officials, National Conference of States on Building Codes and Standards, Inc., Southern Building Code Congress International, Inc. for U.S. DOE, Assistant Secretary for Conservation and Solar Applications, Office of Solar Applications. DOE/CS/4281-1. 81p. and Appendices.

Uniform Solar Energy Code, 1979. International Association of Plumbing and Mechanical Officials, 5032 Alhambra Ave., Los Angeles, CA 90032. 73p. $10.00.

II. SOLAR ARCHITECTURE

BIBLIOGRAPHIES.

Aitken, Donald. *A Bibliography for the Solar Home Builder.* Sacramento, California Office of Appropriate Technology, 1979. 1st copy free, additional copies, $1.00.

NSHACIC. *Bibliography for Architects and Engineers.* DC 140, 1st ed. September 1978. 4p. Free.

DICTIONARIES.

Construction Dictionary. 4th ed. Phoenix, National Association of Women in Construction, Greater Phoenix, Arizona Chapter 98, Box 6142, Phoenix, AZ 85005. 1979. $17.00, prepaid; $18.00, billed orders.

DIRECTORIES.

NSHACIC. *Solar Building and Design Professionals.* (Call NSHACIC for names of people in your area.) Free.

DIRECTORIES. SOLAR BUILDINGS.

NSHACIC. *Selected Solar Buildings In...* (Call NSHACIC for listings in the state desired.) Free.

GRAPHIC STANDARDS

Braden, Spruille. *Graphic Standards of Solar Energy.* Boston, CBI. $10.95.

HISTORY.

NSHACIC. *History of Solar Heating and Cooling.* DC 142, 1st ed. October 1978. 1p. A bibliography.

Butti, Ken. *A Golden Thread; 2500 years of solar architecture and technology.* New York, Van Nostrand, 1980. $15.95.

HOUSE PLANS. BIBLIOGRAPHIES.

NSHACIC. *Solar House Plans; sketches, blueprints, and books.* (Solar source sheet) SS 111, 4th ed. February 1979. 4p.

BOOKS.

Anderson, Bruce. *The Solar Home Book; heating, cooling and designing with the sun.* Andover, MA, Brick House, 1976. $9.50.

Davis, Norah. *At Home in the Sun; an open-house tour of solar homes in the United States.* Charlotte, VT, Garden Way, 1979. $9.95.

Eccli, Eugene. *Low-Cost, Energy-Efficient Shelter for the Owner and Builder.* Emmaus, PA, Rodale, 1976. $7.95.

Frank, Ruth F. *Something New Under the Sun; building Connecticut's first solar home.* Andover, MA, Brick House, 1980. $8.95.

Kern, Ken. *The Owner Built Home; a how to do it book.* Rev. ed. New York, Scribner, 1975. $7.95.

Michels, Tim. *Solar Energy Utilization.* New York, Van Nostrand, 1979.

Montgomery, Richard H. *The Solar Decision Book; a guide for heating your home with solar energy.* New York, Wiley, 1978. $12.95.

Sabady, P.R. *The Solar House; a guide to solar energy utilization in domestic, industrial and commercial building.* Boston, Newnes-Butterworths, 1978. $16.95.

II. SOLAR ARCHITECTURE.

BOOKS. (continued)

Shurcliff, William A. *New Inventions in Low-Cost Solar Heating.* Andover, MA, Brick House, 1979. $12.00.

_____. *Solar Heated Buildings of North America: 120 outstanding examples.* Andover, MA, Brick House, 1978. $8.95.

Tatum, Rita. *The Alternative House; a complete guide to building and buying.* Los Angeles, Reed Books, 1978. $6.95.

Vale, Brenda and Robert. *The Autonomous House; design and planning for self-sufficiency.* New York, Universe Books, 1975. $10.00.

Wade, Alex. *Thirty Energy-Efficient Houses... You Can Build.* Emmaus, PA, Rodale, 1977. $8.95.

Watson, Donald. *Designing and Building a Solar House; your place in the sun.* Charlotte, VT, Garden Way, 1977. $9.95.

Wolfe, Ralph. *Home Energy for the Eighties: plus complete catalog on alternate energy systems.* Charlotte, VT, Garden Way, 1979. $10.95.

PERIODICALS.

RSI: Roofing, Siding, Insulation, incorporating *Solar Contractor.* Monthly. $12.00/year.

III. SOLAR ARCHITECTURE. PASSIVE.

BIBLIOGRAPHIES.

NSHACIC. *Passive Solar Energy Designs and Buildings.* DC 120, 4th ed. July 1979. 6p. Free.

CATALOGS.

Bainbridge, David. *The First Passive Solar Catalog.* Davis, CA, Passive Solar Institute, 1978. $7.50.

CONFERENCES.

Third National Passive Solar Conference, San Jose, January 11-13, 1979. Proceedings of the American Section of the International Solar Energy Society.

FACTSHEETS.

Holzman, David. *Passive Solar Buildings Soak Up Sun.* NSHACIC. January 1979. 9p. Free.

REPORTS.

Calthorpe, Peter. *Solar Study; a comparison study of four passive and hybrid space. heating systems.* The Farallones Institute, 15290 Coleman Valley Road, Occidental, CA 95465. 1978.

Berkeley Solar Group. *Passive Design Saves Energy and Money.* Sacramento, CA, Concrete Masonry Association of California and Nevada, 1979.

BOOKS.

Bainbridge, David. *Village Homes' Solar House Designs; a collection of 43 energy-conscious house designs.* Emmaus, PA, Rodale, 1979. $6.95.

III. SOLAR ARCHITECTURE. PASSIVE.

BOOKS. (continued)

Butler, Lee Porter. *Ekose'a Homes; natural energy conserving designs.* San Francisco, Ekose'a, 1978. $24.95.

Dresser, Peter van. *Homegrown Buildings.* Santa Fe, NM, Lightning Tree, 1979. $5.95 plus $.50 shipping.

Mazria, Edward. *The Passive Solar Energy Book; a complete guide to passive solar home, greenhouse, and building design.* Emmaus, PA, Rodale, 1979. Professional ed., $24.95.

Shurcliff, William A. *Superinsulated Houses and Double-Envelope Houses; a preliminary survey of principles and practices.* William A. Shurcliff, 19 Appleton St., Cambridge, MA 02138. 1980. $12.00.

Wright, David. *Natural Solar Architecture; a passive primer.* Rev. ed. New York, Van Nostrand, 1978. $15.95.

IV. WIND ENERGY.

BIBLIOGRAPHIES.

Energy From the Wind. Basic Volume, July 1975; 1st Suppl., August 1977; 2d Suppl., December 1979. Barbara L. Burke, compiler. $25.00. Order from Publications, Engineering Research Center, Foothills Campus, Colorado State University, Fort Collins, CO 80523.

Over 3800 references to wind energy publications, the most comprehensive bibliography devoted exclusively to windpowers.

Solar Energy Infomation Data Bank. *Wind Energy.* 4p. Available from SERI, 1617 Cole Blvd., Golden, CO 80401, 303-231-1000. Free.

Wind Energy Information Directory. SERI. October 1979. Stock No. 061-000-00350-9. $1.75. Order from Supt. of Documents, U.S. Govt. Print. Office, Washington, DC 20402.

REPORTS.

Wind Energy Program: progress report. California Energy Commission. Jnauary 1, 1980.

Wind Energy Systems; program summary. Prepared for the U.S. DOE, Assistant Secretary for Energy Technology, Office of Solar, Geothermal, Electric, and Storage Systems. December 1978. DOE/ET-0093. Dist. Category UC-60. Paper: $7.25. Microfiche: $3.00. Available from NTIS.

BOOKS.

Beedell, Suzanne. *Windmills.* New York, Scribner, 1976. $12.00, $9.95 pb.

Eldridge, Frank R. *Wind Machines.* 2d ed. New York, Van Nostrand, 1980.

Inglis, David R. *Wind Power and Other Energy Options.* Ann Arbor, Univ. of Michigan Pr., 1978. $16.00, $8.50 pb.

Kovarik, Tom, et al. *Wind Energy; the generation, storage and conversion of wind power for practical use today.* Chicago, Domus, 1979. $12.50, $6.95 pb.

McGuigan, Dermot. *Harnessing the Wind for Home Energy.* Charlotte, VT, Garden Way, 1978. $9.95, $4.95 pb.

IV. WIND ENERGY.

BOOKS. (continued)

Noll, Edward M. *Wind-Solar Energy for Radiocommunications and Low-Power Electronic-Electric Applications.* Indianapolis, Sams, 1975. $7.95.

Putnam, Palmer C. *Power from the Wind.* New York, Van Nostrand, 1948. $11.95.

Torrey, Volta. *Wind-Catchers; American windmills of yesterday and tomorrow.* Brattleboro, VT, Greene, 1976. $12.95.

PERIODICALS.

Wind Energy Report; the international newsletter of wind power. Box 14, Rockville Centre, NY 11571. Monthly. $95.00/year.

Wind Power Digest. Jester Press, 55468 CR 31, Bristol, In 46507. Quarterly. $8.00/year.

V. WOOD ENERGY.

BIBLIOGRAPHIES.

Wood Industry Abstracts; summaries of current technical literature on wood procurement, treatment, processes and products. Washington State University Engineering Extension Service. Pullman, WA 99164. Bimonthly. $60.00/year.

DIRECTORIES.

Manufacturers and Distributors: wood burning stoves/heat from waste/heat transfer. New York, Synerjy. $2.50.

Woodstove Directory: fireplace and equipment; the international sourcebook of wood-heat equipment. Annual. 1980. $2.00.

BOOKS.

Curtis, Christopher and Donald Post. *Be Your Own Chimney Sweep.* Charlotte, VT, Garden Way, 1979. $4.95.

Gay, Larry. *The Complete Book of Heating with Wood.* Charlotte, VT, Garden Way, 1974. $4.95.

Ivins, David. *The Complete Book of Woodburning Stoves.* New York, Sterling, 1978. $6.95.

Michaelson, M. *Firewood; a woodcutter's fieldguide to trees in summer and winter.* Mankato, MN, Gabriel, 1978. $2.95.

Shelton, Jay W. *Wood Heat Safety.* Charlotte, VT, Garden Way, 1979. $3.95.

Sunset Homeowner's Guide to Wood Stoves. Menlo Park, CA, Lane, 1979. $3.95

Sunset How to Plan and Build Fireplaces. Menlo Park, CA, Lane, 1980. $3.95.

Twitchell, Mary. *Wood Energy; a practical guide to heating with wood.* Charlotte, VT, Garden Way, 1978. $7.95.

Vivian, John. *The New, Improved Wood Heat.* Emmaus, PA, Rodale, 1978. $7.95.

V. WOOD ENERGY.

PERIODICALS.

Home Energy Digest/Wood Burning Quarterly. 8009 34th Ave. S., Minneapolis, MN 55420. Quarterly. $7.95.

Wood 'N Energy (a joint publication of the Society for the Protection of New Hampshire Forest and the Wood Energy Institute). The Society, 5 S. State St., Concord, NH 03301. No price given.

VI. INVENTORS.

NSHACIC. *Locating and Obtaining Patents for Solar Energy Inventions*. SS 109, 1st ed. December 1978. 3p. Free.

National Bureau of Standards. Office of Energy-Related Inventions. *Request for Evaluation of an Energy-Related Invention*. Evaluation Request Form (NBS-1019). Available from Office of Energy-Related Inventions, National Bureau of Standards, Washington, DC 20234.

_____, *The NBS/DOE Energy-Related Inventions Program: what it is and how it works*. Free. Order from National Bureau of Standards, National Engineering Laboratory.

Impact (Solar Energy Patents). Box 1972, Estes Park, CO 80517. Monthly. $40.00/year.

DIRECTORY

SELECTED SPECIAL LIBRARY ENERGY COLLECTIONS WITH PUBLIC ACCESS

There are many Bay Area special libraries with collections on energy, some with unique resources. Though many of these are not open to the public, their resources are accessible by referral from one of the public access collections. Area energy librarians have formed a network called Energy Librarians of the Bay Area (ELBA), which is described on the first page of this directory.

Following are profiles of the major public access special library energy collections in Northern California:

- U.S. Department of Energy, Energy Resources Center
- California Energy Commission Library
- California Office of Appropriate Technology Library
- Stanford University, Energy Information Center
- University of California, Berkeley, Energy Information Center

Several of these profiles have appeared in the "Area Special Collections" column of *BARC Notes*.

--Compiled by Audrey Powers for BARC's "Alternative Energy Workshop," April 24-25, 1980

INFORMATION SHEET ON ENERGY LIBRARIANS OF THE BAY AREA (ELBA)

By Mari Wilson, Librarian
Energy Information Center
University of California, Berkeley
January 1980

Energy Librarians of the Bay Area (ELBA), organized in November 1975, is an information network of special libraries with special collections in energy sources, alternatives, and related topics.

At present, there are 23 libraries and 33 librarians from academic, research, state government and private industry institutions, such as the University of California at Berkeley, Stanford University, California State Energy Commission, California Office of Appropriate Technology, Lawrence Berkeley Laboratory, Electric Power Research Institute, Bechtel Corporation, Chevron Research Company, etc.

The purpose of ELBA is to facilitate communication and cooperation among these special libraries and to disseminate current and needed energy information in a fast and effective manner to specialized clientele, as well as the community, state and nation.

It is generally accepted that lack of information, incomplete data, and delays in accessing needed information on alternative energy sources are major obstacles to rapid implementation. ELBA helps overcome these barriers by linking together the libraries which can provide up-to-date information on current energy research topics. When collections cannot be complete or comprehensive due to lack of funding, space or other constraints (such as the exponential growth of the literature), resources can be shared through interlibrary loan of hard-to-find books, reports and journal articles. When documents cannot be provided in time to meet patrons' deadlines, patrons can be referred to information specialists or other special libraries with particular expertise or strengths in that field. Through this information and resource sharing, energy librarians are able to extend valuable information resources to users over a wide geographic area.

ELBA provides the network which allows energy librarians to meet, exchange ideas, compile bibliographies, improve collections, share resources, develop systems and talk about common problems. In addition, to enable energy librarians to respond more fully to the demands of a rapidly changing field of research, the ELBA meetings include lectures by guest speakers on energy research or library related topics, such as solar thermal power plants or the recent copyright law, thus providing needed professional development services to energy librarians.

For more information contact Carol Backhus, ELBA Coordinator, 415-486-4102; Gloria Haire, 415-486-4626; Marian Rees, 415-497-3237; or Mari Wilson, 415-642-1004.

U.S. DEPARTMENT OF ENERGY, REGION IX OFFICE
ENERGY RESOURCES CENTER
333 Market Street, 7th floor
San Francisco, CA 94105

Norma DelGaudio, Information Specialist
Phone: 415-764-7035
Hours: M-F 8 am-5 pm

Background

The Energy Resources Center is a public service offered by the U.S. Department of Energy's (DOE) Region IX Office in San Francisco. The Center provides telephone, mail and walk-in reference assistance for librarians, teachers, inventors, writers, consultants, builders, environmentalists, businessmen, government agencies and other interested members of the public concerned with any aspect of energy.

Set up in 1976, the Center's collection now consists of over 5000 volumes, 60 periodical titles, technical reports, clippings, films and slides. Materials do not circulate but photocopy facilities are available, and materials can be obtained on interlibrary loan. The Center has access to DOE's RECON database and can do short searches free for patrons. In addition to print and online sources, the Center has information on specializations of DOE staff, of other related government agencies and resource groups, and referrals can be given.

Subjects covered

Energy, all types, including:

Biomass	Geothermal	Oil shale	Tar sands
Coal	Natural gas	Petroleum	Tidal power
Fusion	Nuclear	Solar	Wind

All aspects of energy, including:

Conservation	Forecasts	Production
Consumption	Government energy policy	Statistics
Demand	Pricing	Storage
		Waste management

Types of materials in the collection

Energy Emergency Handbook
Environment Law Review
Microfiche and hard copy technical reports, mostly from DOE's Energy Information Administration
Environmental impact statements relating to energy
File of recent energy related speeches by U.S. government officials
16mm DOE films on energy (can be previewed on premises)
Publications from government agencies:
U.S. Congress hearings on energy
International Atomic Energy Agency
U.S. Department of Energy (including some publications from predecessor agencies: AEC, ERDA, FEA). Hard copy of selected DOE periodicals and other publications:

Energy Abstracts for Policy Analysis	*Fossil Energy Update*
Energy Conservation Update	*Fusion Energy Update*
Energy Data Reports	*Geothermal Energy Update*
Energy Research Abstracts	*Monthly Energy Review*
Federal Energy Guidelines	*Solar Energy Update*

Microfiche of other DOE publications
Publications from organizations such as:

Electric Power Research Institute	National Alcohol Fuels Information Center
Environment Information Center	National Science Teachers Association
International Solar Energy Society	National Solar Heating and Cooling Information Center
	Solar Energy Research Institute

Types of materials in the collection (continued)

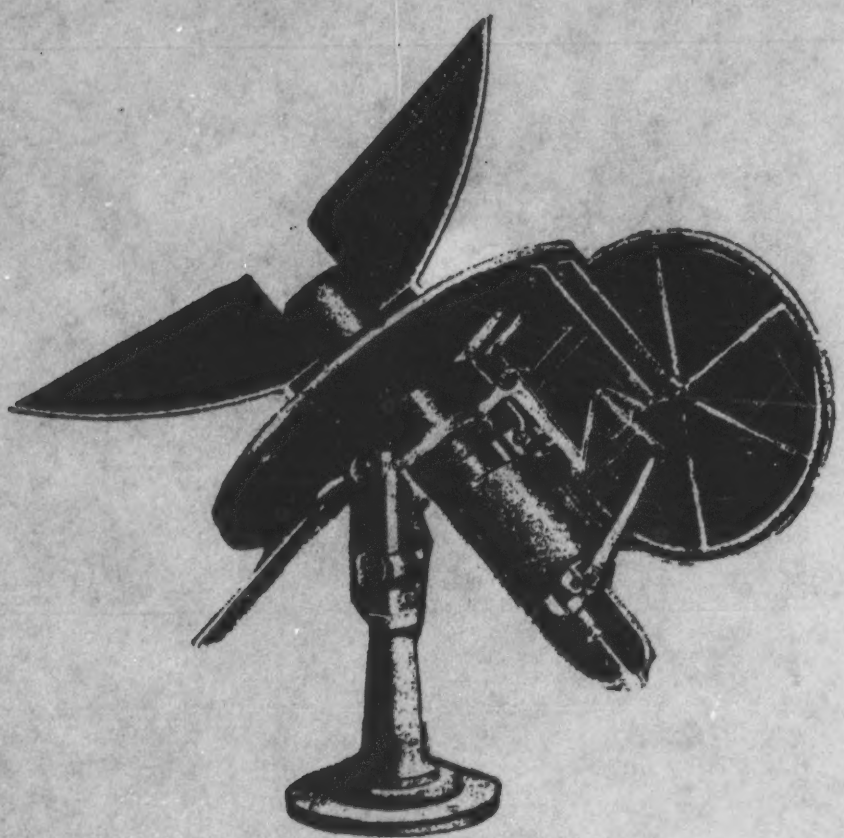
Additional periodicals, looseleaf services, indexes and abstracts:

Advanced Solar Energy Technology Newsletter
Alternate Architecture; the energy management journal
Alternative Sources of Energy
Crude Oil Imports
Current Energy & Ecology
Energy Action Weekly
Energy Daily
Energy Digest
Energy Directory Updates
Energy Information Abstracts
Energy Research Digest
Energy Today
Energy Users Report (Bureau of National Affairs)
Inside FERC (Federal Energy Regulatory Commission)
Inside DOE (Department of Energy)
Oil Daily
Oil Express
Petroleum Intelligence Weekly
Platt's Oil Regulation Report
Platt's Oilgram News Service
Solar Age
Solar Energy
Solar Greenhouse Digest
Sun Up Energy News Digest
Synfuels
U.S. Oil Week
Washington Energy Monitor

Special collections, files and indexes

Clipping file, consisting of newspaper and magazine clippings, pamphlets, brochures, research reports, etc. Sample topics:

Alternative energy
Coal drying
Coal gasification
Electric hybrid vehicles
Fuel cells
Gasoline rationing
Greenhouse effect
Hydrogen energy
Methane
Methanol
Pipelines
Solar
- Furnaces
- Mobile homes
- Parabolic reflectors
- Stills
- Water pumps



·SOLAR ENGINE ACTUATED BY ATMOSPHERE AIR

CALIFORNIA (STATE) ENERGY COMMISSION LIBRARY
1111 Howe Street, Room 317
Sacramento, CA 95825

Christine Portillo, Librarian
Phone: 916-920-6468
Hours: M-F 8 am-5 pm

Background

The 1975 Warren-Alquist Act established the Energy Resources Conservation and Development Commission, whose purpose included determining overall state power policy, selecting sites for new power plants, forecasting state energy demand and supply, and developing contingency plans for possible power shortages in the state. In 1978 the commission changed its name to the California Energy Commission (CEC).

The commission's library was established in 1975, with separate Archives and a Law Library. The collection contains approximately 10,000 titles, 350 periodical titles, technical reports, government documents, and a vertical file. The library primarily serves the staff of the commission; however it is open to the public and provides telephone reference and referrals to other organizations. Materials do no circulate, but photocopy facilities are available, and materials can be obtained on interlibrary loan.

Libraries are requested to direct inquiries from the public on general subjects (e.g. consumer information, fuel allocation) or on current activities of the commission to the Public Advisor, 916-920-6906. Contact the Publications Office, 916-920-6216 for copies of the commission's publications catalog and mailing lists.

Subjects covered

Energy, all types, including:
- Biomass
- Coal
- Geothermal
- Nuclear
  - Electric power plants
  - Safety aspects
- Petroleum
- Solar
  - Ocean thermal
  - Photovoltaics
- Synthetic fuels
- Wind

All aspects of energy, including:
- Conservation
- Consumption
- Demand
- Electric vehicles
- Environmental effects, including safety
- Forecasts, projections
- Government energy policy
- Power resources
- Pricing
- Production
- Public utilities
- Statistics
- Waste management

The collection contains all levels of treatment, from general to highly technical.

Types of materials in the collection

Energy atlases, dictionaries, statistical sources, biographical sources and directories of energy agencies and programs

NTIS microfiche on energy

Maps, including subject maps on energy resources and U.S. Geological Survey quadrangle maps of California

Solar Product Specifications Guide

Looseleaf services, including:
- *Energy Controls* (P-H)
- *Energy Management* (CCH)
- *Energy Users Report* (BNA)
- *Environment Reporter* (BNA)
- *Nuclear Power Experience* (descriptions, diagrams, history, technical information for all nuclear power plants)

Publications from government agencies:
- California Energy Commission (receive all, including transcripts of CEC hearings, 1978+; pre1978 transcripts are in CEC Archives)
- California Public Utilities Commission
- California Department of Water Resources
- International Atomic Energy Agency
- U.S. Bureau of the Census

Types of materials in the collection, continued

U.S. Department of Energy

Energy Abstracts for Policy Analysis
Energy Research Abstracts
Federal Energy Guidelines
Fossil Energy Update
Geothermal Energy Update
Solar Energy Update

U.S. Environmental Protection Agency

U.S. Nuclear Regulatory Commission

Construction Status Report; Nuclear Power Plants

Series of *Final Safety Analysis Reports*, which are applications for nuclear power plant construction, and includes environmental impact reports, diagrams, etc. for California plant sites at Diablo Canyon, Palo Verde, Rancho Seco, San Onofre, Sundesert.

Publications from organizations such as:

American Gas Association
American Institute of Architects
American Nuclear Society
American Petroleum Institute
American Planning Association
Electric Power Research Institute
Environment Information Center
Fusion Energy Foundation
Geothermal Resources Council
Rand Corporation
Sierra Club
Solar Energy Research Institute

Additional periodicals, indexes and abstracts:

Alternative Sources of Energy
Biomass Digest
California Solar Coalition News
Coal Cleaning Review
Coal News
Coal Week
Critical Mass Journal
Ecology Law Quarterly
Electric Vehicle News
Energy (NTIS)
Energy Abstracts (Engineering Index)
Energy Action Weekly
Energy and Alternatives
Energy and Buildings
Energy and Environmental Assessments
Energy Collector
Energy Daily
Energy Digest
Energy Directory Update
Energy Economics
Energy Forum
Energy Index
Energy Information Abstracts
Energy International
Energy Planning Report
Energy Policy
Energy Reporter
Energy; the international journal
Energy Today
Energy User News
Environment Index
Environmental Review of Synthetic Fuels
Geothermics
Home Energy Digest and Wood Burning Quarterly
INIS Atomindex
In Situ: oil, coal, shale, minerals
Inside DOE (Department of Energy)
Inside FERC (Federal Energy Regulatory Commission)
Inside NRC (Nuclear Regulatory Commission)
Insulation Reporter
International Journal of Electrical Power and Energy Systems
International Journal of Fusion Energy
International Journal of Hydrogen Energy
Light Steam Power
Lundberg Letter
Nuclear Fuel
Nuclear Law Bulletin
Nucleonics Week
Nuexco; Monthly Report to the Nuclear Industry
Ocean Energy
Oil Daily
Oil Express
Petroleum Intelligence Weekly
Platt's Oilgram News Service
Rain
Soft Energy Notes
Solar Age
Solar Energy Intelligence Report
Solar Energy Research and Development Report
Solar Energy Update
Solar Heating and Cooling
Solar Law Reporter
Solar Outlook
Solar Times
Solar Utilization News
Synfuels
Windletter
Windpower Digest
Wind Technology Journal

Special collections, files and indexes

Vertical file of pamphlets, maps and other materials for the general public from the U.S. DOE and other organizations; small file covering subjects of interest to the collection.

CALIFORNIA (STATE) OFFICE OF APPROPRIATE TECHNOLOGY LIBRARY
1530 Tenth Street
Sacramento, CA 95814

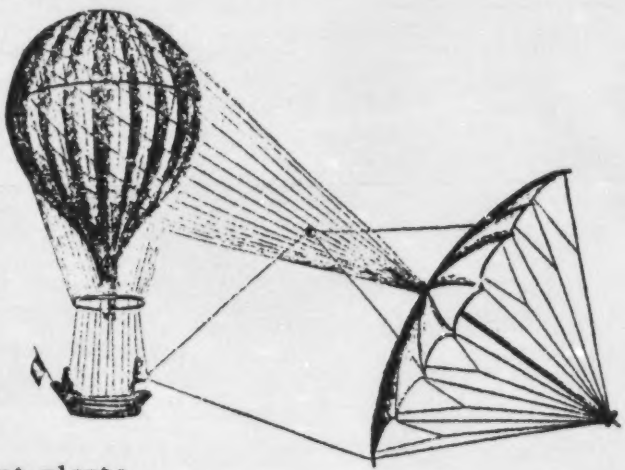
Barbara Martinez, Librarian
Janice Jacobson, Information Specialist
Phone: 916-445-1803
Hours: M-F 7:30 am-5:30 pm

Background

The State of California's Office of Appropriate Technology (O.A.T.) was established in 1976 as part of the Governor's Office of Planning and Research. O.A.T.'s mandate is to develop technologies that are less harmful to people and the environment than the expensive, complex, centralized technologies of the past. O.A.T. provides information on technologies which increase self-reliance and community autonomy and encourage conservation and the use of renewable sources of energy. In addition, O.A.T. provides technical assistance to state agencies and sponsors demonstration programs in cooperation with other agencies.

The library was set up primarily to serve state employees, and materials circulate only to state agencies. However, the public can use materials there, and photocopy facilities are available. Staff provides telephone and mail reference and referrals to other appropriate organizations. The collection consists of 3500 volumes, 160 periodicals, government documents and vertical files.

Among the publications of O.A.T. are:
A Bibliography for the Solar Home Builder
The Grants Newsletter
Present Value: constructing a sustainable future
Rural Wastewater Disposal Alternatives
Solar Gain
Solarwork
Publications lists are available from O.A.T.



Subjects covered

Appropriate technology and applications
Aquaculture
Community economic development
Community energy planning
Community gardens, including drought resistant plants
Energy and alternative fuels
- Alcohol
- Biomass
- Hydroelectric power
- Hydrogen
- Solar
- Wind

Energy conservation
Energy planning and development
Grants for small scale energy projects
Jobs in energy
Hazardous wastes
Resource recovery and recycling
Self-reliance

Types of materials in the collection

Bibliographies on alternative energy and appropriate technology, including such topics as solar power, wind power, compost toilets, etc.
Solar Product Specifications Guide

Types of materials in the collection (continued)

Publications from:

California Energy Commission
Center for Renewable Resources
Citizens Energy Project
Farallones Institute
Institute for Local Self-Reliance
National Center for Appropriate Technology
Solar Energy Institute
U.S. Department of Energy
U.S. Department of Housing and Urban Development
U.S. Office of Technology Assessment
Western Sun

Special collections, files and indexes

Card file on appropriate technology and related private and government organizations from California and other states, and from other countries. This file contains contact information and literature on the groups, with access by name and subject area, e.g. solar, wind, antinuclear groups.

Vertical file of pamphlets and current newspapers (*Los Angeles Times, San Francisco Chronicle, Sacramento Bee*) and magazine clippings on all aspects of appropriate technology and energy. Included is information on consultants, manufacturers, specifications, etc.

Additional information on Office of Appropriate Technology projects and services

The New Possibilities Show is the office's traveling trailer exhibit. The trailer tours the state, stopping at schools, fairs, libraries, and shopping centers to display such hardware as solar collectors, as well as to demonstrate how people in California can save water and energy at home, and can use the principles of solar heating and cooling, recycle some wastes, and produce food. Interested librarians can schedule the exhibit by phoning O.A.T.

The O.A.T. Design Team is a group of technical specialists with backgrounds in architecture, engineering, planning, and economics. They specialize in building conservation, solar applications, wind energy conversion systems, non-conventional waste treatment, small scale hydroelectric systems, and biomass conversion.

The Local Assistance Group helps both local governments and community organizations achieve greater self-reliance by helping to organize, focus, and develop local plans, by identifying sources of technical information and funding, and by building cooperative relationships with local agencies.

The Energy Projects Group has written a curriculum to train CETA-eligible people to install solar heating systems, and developed the state plan to implement the U.S. Department of Energy's Energy Extension Service in California, which is now underway.

The Publications and Information Unit maintains the library and regularly publishes the *Grants Newsletter*. The group is currently working on an alcohol fuels publication and a book on model solar projects. It has just released *Solar Gain*, a book describing the winning designs of the Passive Design Competition, which the office held last year.

STANFORD UNIVERSITY
ENERGY INFORMATION CENTER
Institute for Energy Studies
Room 500A, Building 500
Stanford, CA 94305

Marian Rees, Librarian
Phone: 415-497-3237
Hours: M-F 9 am-noon; 1 - 6 pm
Sat/Sun 1 - 4 pm

Background

The Energy Information Center is operated by Stanford University's Institute for Energy Studies. Organized in 1973, the Institute is not a separate department at Stanford, but involves faculty within the Schools of Business, Earth Sciences, Engineering, Humanities, Science and Law. The Institute supports specific energy policy studies and new energy research, conducts seminars, supports graduate study, sponsors visiting professors, and publishes monographs and a newsletter. A current publications list is available from the Institute.

The Center primarily serves the Stanford University community; however it is open to the public and provides some telephone reference and referrals to other organizations. Materials do not circulate, but photocopy facilities and limited interlibrary loan are available. There is no charge for use of the facilities by members of the general public, but consulting and profitmaking research firms are charged $25 per day for use. The Center is not part of the Stanford University Library System and cannot supply materials from other campus libraries.

The Center's collection dates from 1974, and supports classes in energy at Stanford and the research of the Institute for Energy Studies. It consists of over 10,000 volumes, several thousand technical reports, 125 periodicals, government documents, a news clipping file and videotapes of energy workshops.

Subjects covered

Collection consists of technical, research oriented current materials.

Energy, all types, including:

- Biomass
- Coal
- Energy from plants
  - Wood, especially eucalyptus
- Geothermal
- Hydroelectricity
- Hydrogen
- Natural gas
- Nuclear
  - Environmental aspects
  - Technical aspects
- Oil shale
- Petroleum
- Solar
  - Photovoltaics
  - Thermal sea power
  - Thermal-electric conversion
- Tar sands
- Tidal power
- Wind power

All aspects of energy, including:

- Conservation
- Consumption
- Demand
- Energy industry
- Environmental effects
  - Cost benefit analysis
  - Risk analysis
- Forecasts, projections, including historical
- Government energy policy and regulation
- Ocean farming
- Power generation
- Pricing
- Production
- Research
  - Grant support
- Resource evaluation
- Societal questions
  - Attitude surveys
  - Ethical considerations
- Statistics
- Systems analysis
  - Energy modeling
  - Net energy analysis
- Technology
- Transportation
- Waste management
- World energy

Types of materials in the collection

Microfiche and paper copy technical reports, including complete collections of:
- NTIS category 97 (Energy)
- Massachusetts Institute of Technology, Energy Laboratory reports
- Princeton Plasma Physics Laboratory reports (fusion project)

Videotapes of energy workshops and seminars held at Stanford since 1975 (large file)

Reports on energy from companies such as Aramco, Bechtel, Exxon, GE, Standard Oil, etc.

Proceedings from conferences and symposia on energy research

Publications from organizations such as:
- American Institute of Architects
- American Nuclear Society
- American Petroleum Institute
- Atomic Industrial Forum
- Electric Auto Association
- Electric Power Research Institute
- Engineering Societies Committee on Energy
- Institute of Gas Technology
- International Solar Energy Society
- Rand Corporation
- Solar Energy Research Institute

Publications from government agencies:
- California Energy Commission
- California Office of Appropriate Technology
- International Energy Agency (receive all)
- U.S. Department of Energy
- U.S. Environmental Protection Agency
- U.S. National Aeronautics and Space Administration (especially publications on satellite power systems)
- Newsletters from state energy agencies in Oregon and New Mexico and from similar agencies for France, Brazil and other Latin American countries.

Sample list of periodicals, looseleaf services, indexes and abstracts:
- *Access to Energy*
- *Alternative Sources of Energy*
- *Coal Abstracts*
- *Coal R & D*
- *Energy*
- *Energy and Buildings*
- *Energy Communications*
- *Energy Conservation Digest*
- *Energy Conservation Update*
- *Energy Consumer*
- *Energy Daily*
- *Energy Insider*
- *Energy Policy*
- *Energy Research Abstracts*
- *Energy Research Reports*
- *Energy Review*
- *Energy: the international journal*
- *Energy Users Report* (BNA)
- *Geoheat*
- *Geothermal Energy Magazine*
- *International Energy Indicators*
- *International Energy Statistical Review*
- *Journal of Energy*
- *Latin American Energy Report*
- *Nuclear Industry*
- *Petroleum Intelligence Weekly*
- *Solar Age*
- *Solar Cells*
- *Solar Energy Intelligence Report*
- *Solar Energy Update*
- *Solar Engineering*
- *Solar Greenhouse Digest*
- *Solar Law Reporter*
- *Sun Times*
- *Sun World*
- *Synfuels*

Special collections, files and indexes

Current magazines and newspapers are clipped for articles on all aspects of energy which the collection covers; materials are classified and interfiled with the book collection.

The Energy Research File indexes all Stanford research projects on energy; there is subject and personal name access.

A separate catalog indexes videotapes by speakers' names, organizations and subjects.

UNIVERSITY OF CALIFORNIA
ENERGY INFORMATION CENTER
Room 100A, Building T-4
Berkeley, CA 94720

Mari Wilson, Librarian
Phone: 415-642-1004
Hours: M-F 1 pm-5 pm

Background

The Energy Information Center is funded through U.C. Berkeley's interdisciplinary Energy and Resources Program and was created to serve faculty and graduate students in the Program. The staff also works with government agencies, the campus community and the public. The Center's collection dates from 1973 and consists of over 2000 monographs, 100 periodicals, 3000 U.S. Department of Energy reports and 10,000 microfiche. Primarily a current collection, most material dates from 1974 to the present. The collection generally does not duplicate materials from the engineering, government documents, earth sciences and other related collections in the U.C. Berkeley library system; the U.C. microfiche catalog provides listings for these collections.

The Center is open to the public and provides telephone reference and referrals to other appropriate organizations. Materials do not circulate, but photocopy facilities are available. Publications of the Center include bibliographies on selected energy topics and the Energy Classification Scheme, devised by the Center. Staff welcomes inquiries on setting up similar collections.

Subjects covered

Appropriate technology
Energy, all types; collection is strongest on Nuclear and Renewable resources (solar, wind, biomass)
All aspects of energy, including
- Comparative environmental impacts of energy, including safety
- Conservation (policy and analytical aspects)
- Consumption
- Demand
- Energy in developing countries
- Energy policy, U.S. and international
- Resource economics
- Statistics
- Waste management

Types of materials in the collection

Proceedings from conferences and symposia on energy research
Publications from the International Solar Energy Society
Reports on solar energy from universities and private consulting firms
Microfiche of NTIS reports on energy
Selected titles from U.S. Department of Energy
Sample list of periodicals, looseleaf services, indexes and abstracts:
- *Alternative Sources of Energy*
- *Ambio*
- *Energy Insider*
- *Energy International*
- *Energy Policy*
- *Energy Reporter*
- *Energy Research Abstracts*
- *Energy Research Reports*
- *Energy: the international journal*
- *Energy Users News*
- *Energy Users Report* (BNA)
- *Energy Watch*
- *Journal of Energy and Development*
- *Nucleonics Week*
- *People and Energy*
- *Self-Reliance*
- *Soft Energy Notes*
- *Solar Age*
- *Solar Energy*
- *Solar Energy Intelligence Reports*
- *Solar Energy Update*
- *Wind Power Digest*

Special collections, files and indexes

Vertical file of current pamphlets, charts, graphs, maps and clippings on energy related subjects such as energy policy and alternative sources of energy.